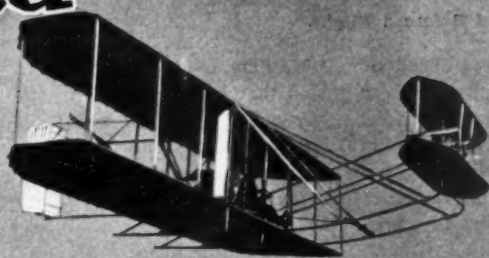


# THE AUTOMOBILE

## How Wilbur Wright "Motored" at Le Mans



BY  
W. T. Bradley

LE MANS, Aug. 20.—Wilbur Wright is the hero of the hour. His machine lies in the wooden shed on the Hunaudières racecourse with one wing completely broken, and is not expected to be out again for a week, but even in his accident the American aeronaut has triumphed. It happened on Thursday morning last, after a more than usually brilliant flight that had caused Engineer Surcouf, of *Ville de Paris* fame, to exclaim: "Our machines are but children's toys."

On the previous days the crowd had been too big for Wilbur Wright's ideas of seclusion, and, instead of flying in the evening, the aeroplane was brought out of the shed which it shares with its pilot and placed on the wooden starting rail at 6 A. M. A few minutes after seven, all being ready, attachment was made to the catapult, the motor started, and the apparatus sent spinning through the air. For 8 min. 13 2-5 sec. it evolved over the ground, making big sweeps, cutting short to swing round as if on a pivot, flying over the tree tops at a height of 80 to 85 feet, then descending to twenty feet from the ground, to mount up again a moment later, all being done in a fresh northwest breeze that would have sorely troubled any other sky pilot.

When he had had enough of it, the apparatus was brought nearer to earth, the engine cut out, and the artificial bird allowed to gracefully settle down on its wooden skates, the operation being performed with such gentleness that not a tremor was observable on the canvas frame. Half an hour later the apparatus was off again, but from the first it was noticed that the motor was missing. Nevertheless, Wilbur Wright mounted to a height of 90 feet, the highest altitude ever attained by a heavier-than-air machine in France, and appeared to be little troubled by the irregular firing of his engine. After remaining a minute in the air and describing a huge circle, the aeroplane was brought to about 30 feet from the ground, the engine cut out, and

a gentle gliding movement downwards begun. Suddenly it was seen that the machine was heeling more than usual, the left wing touched the ground, there was a sound of breaking spars, and a second later the aeroplane had collapsed. As soon as Wilbur Wright had extricated himself from the wreckage, without a scratch to show for his fall, he explained that, seeing he was about to alight on a mound of earth, he had tried to change the direction of the machine, but owing to insufficient training pulled the lever the wrong way, with the result that the left wing struck the object he was trying to avoid. Since coming to France the controlling mechanism of the aeroplane has been changed, all operations now being performed by two levers only; when

in the States there were four levers, two being operated by Wilbur and two by Orville Wright. It was owing to inexperience with this system that the accident happened.

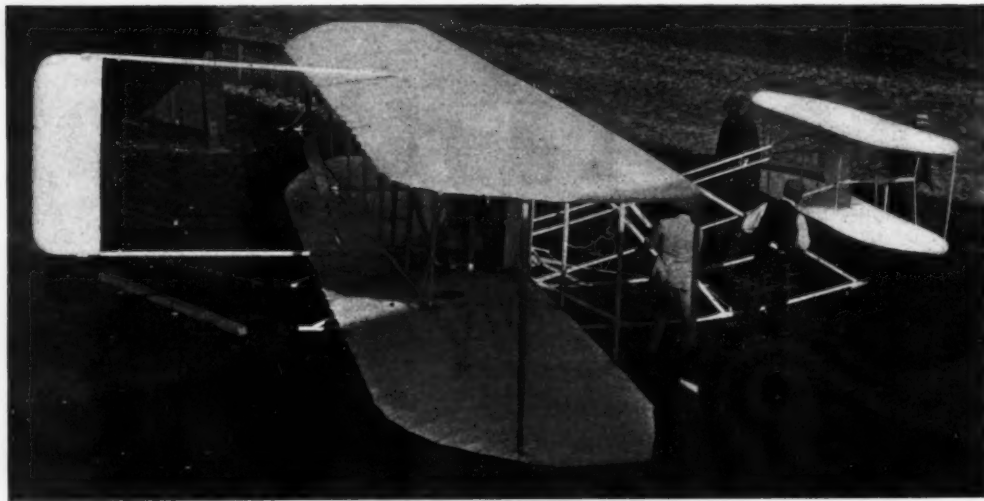
Though the person most interested looked upon the false movement as a piece of stupidity, the public regarded the descent as a triumph, for by it Wilbur Wright had proved that the stoppage of the engine was not a source of danger, the operation of coming to earth having been performed with the ease and certainty of a powerful bird.

On the Wednesday morning, also about 7 o'clock, an excellent flight, lasting 6 min. 56 2-5 sec., was made in a fresh breeze, and at a height which at one moment reached 80 feet. Eight rounds were made of the racecourse at a speed averaging 35 miles an hour, the distance covered being about five miles. It was not a long-distance test, however, for the machine was changed in direction every minute or so, various figures being described to the astonishment of the spectators, none of whom had ever before seen such work in a 10-mile-an-hour breeze. On the evening of the same day two other attempts were made, but the first only lasted 40 seconds and the second 1 min. 45 sec. The wind was rather strong, and Wilbur Wright preferred not to take any risks, declaring that he could fly with ease if his brother were there to help him control the machine, but that the operation was difficult for one man.

Tuesday's flight, executed late in the evening, consisted of three com-



Wright and Kapferer at Le Mans.

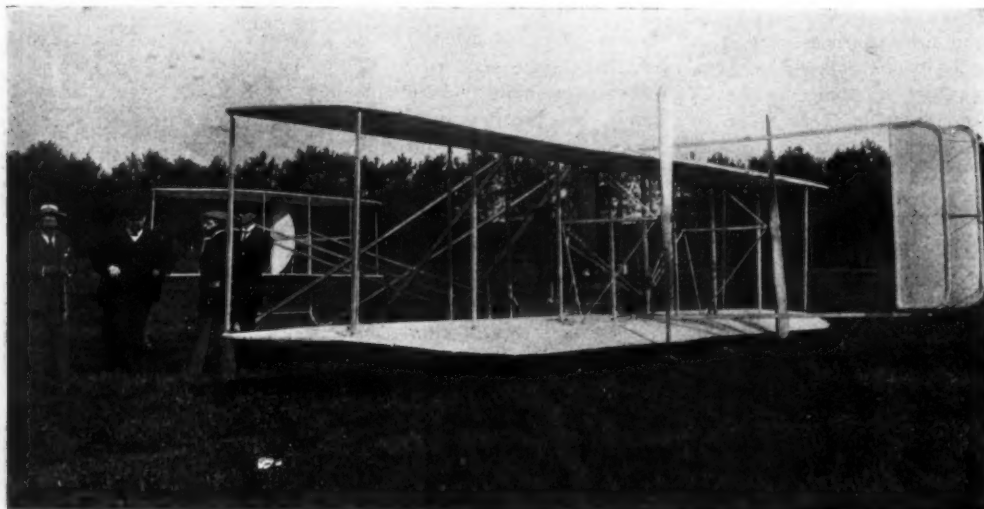


Bringing Aeroplane from Its Shed Before a Flight.

plete circles of the racecourse in 3 min. 43 sec., at a speed of 38 miles an hour. On Monday two successful flights were made, the first of 42 seconds, the second of 1 min. 41 sec. Though remarkably successful work has been done, these flights have been undertaken entirely with a view of familiarizing the operator with his machine and the ground, no attempt whatever being made to break records. This is shown by the progressive nature of the flights, which are as follows:

Saturday, August 8.....	1 minute, 45 seconds.
Monday, August 10.....	False start.
	42 seconds.
	1 minute, 41 seconds.
Tuesday, August 11.....	3 minutes, 43 seconds.
Wednesday, August 12.....	40 seconds.
	1 minute, 45 seconds.
	6 minutes, 56 2-5 seconds.
Thursday, August 13.....	8 minutes, 13 2-5 seconds.
	1 minute, height record of 90 feet, broke wing in descending.

So complete has been the triumph of Wilbur Wright that in French aeronautical circles there is only one opinion on the abilities of the man from Dayton. Such practical aeronauts as Delagrangé, Surcouf, Kapferer, and Zens declare that the results are marvelous, far surpassing anything they ever thought possible. It must be remembered, too, that the majority of French aeronauts were firmly convinced that the Wright brothers were huge bluffers. The most astounding thing is that two men should, alone and unaided, have worked at such a problem and achieve success with the scanty means at their disposition. For the machine which has astounded the world is the exclusive work of Wilbur and Orville Wright; even the engine is the production of the brothers from Ohio.



Messrs. Berg, Bollee, Kapferer and Wright Beside Aeroplane.

It is here that there is room for criticism, but even the criticism sounds strangely like praise. The motor and aeroplane have been built by the two brothers, and as it is practically impossible for any two men with rather limited means to show such results as the best factories, manned by experts in the different branches, there are things that the technical man can quibble at. The motor, declared one engineer, looks as if it had been made by a clever village locksmith. The framework is ingenious and strongly constructed for use, but it has not the fine finish of the French machines. The latter, however, fly with a certain hesitation, as if they had not yet got out of their

swaddling clothes, while the Wright apparatus is a mechanical bird that has been bred to the air. There is this difference between the American and the French machines, that the former has grown up with the men who operate it, and is the result of years of long study and practice; the latter have been made by skilled workmen who have never flown, and have been handed ready-made to men who have not yet obtained many of the secrets of the birds.

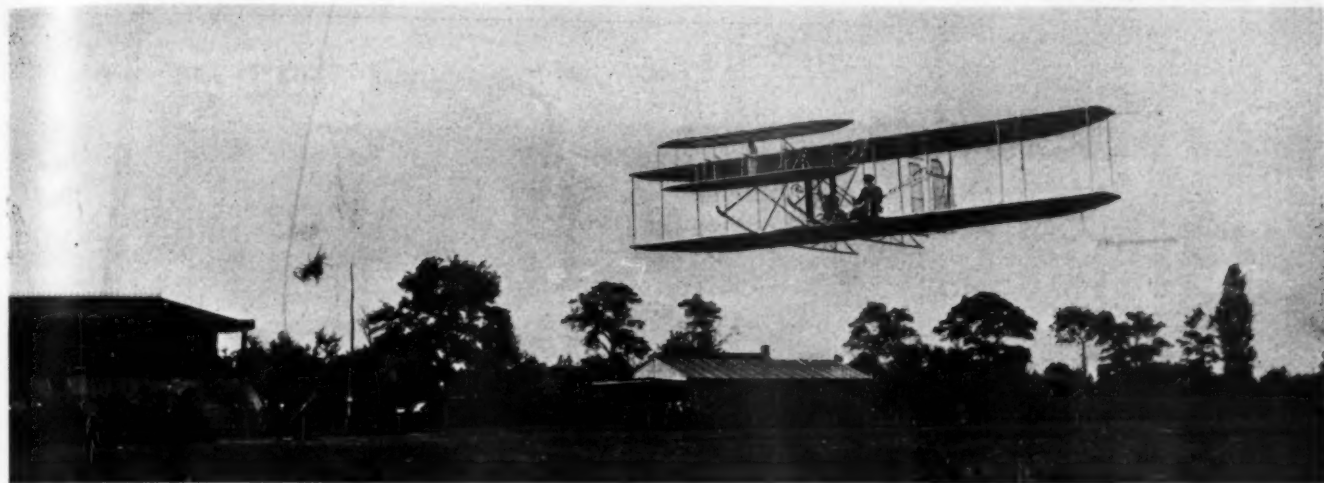
In principle there is little difference between the machines used by Farman and Delagrangé and that of the Wright brothers. The closest resemblance lies with the apparatus with which Santos-Dumont, in 1906, first made a mechanical flight in Europe, for the Brazilian's machine, unlike those which immediately followed, had no tail and had its elevation planes in front.

The Wright machine consists of two superimposed, slightly concave wings, 40 feet from tip to tip, and distant one from the other about eight feet. They are mounted across the rear end of a couple of runners having a strong resemblance to the runners of a sleigh. In front are two smaller superimposed planes, the object of which is to provide for the ascension and descent of the mechanical bird. Naturally, these are pivoted, and can be controlled by the pilot. To the rear are two vertical rudders, made like the wings of a wooden frame covered with canvas. Between the two elevation planes is a small vertical rudder connected with the large ones in the rear, and designed exclusively to act as a tell-tale.

Midway on the lower wing is the 25-horsepower four-cylinder gasoline motor which has come in for so much criticism in France. Though it has given satisfactory service, it is certain

that better results could have been obtained by the adoption of one of the light-weight engines put on the market by specialists in aeronautical work. The Wright brothers, however, appear to have taken a pride in constructing the entire apparatus themselves. The engine is the ordinary automobile article, with detail modifications. The cylinders are separate, surrounded by copper water jackets, camshaft within the crankcase operating overhead valves by means of rocker arms. The carbureter has been abolished in favor of direct fuel-feed by means of a pump and distributor mechanism. Ignition is by means of high-tension magneto driven off the camshaft through gears outside





Wright Aeroplane in Successful Flight at Fair Grounds, Le Mans, France.

the crankcase. On the rear end of the engine shaft are two pinions, each one connecting up, by means of a chain, with a propeller shaft a couple of feet above the engine base and to the left and right of it. The two wooden propellers are driven in contrary directions at 400 r.p.m. for 1,000 r.p.m. of the engine.

The gasoline supply is contained in a tall vertical copper cylinder attached to one of the uprights between the two planes. Thus whatever the angle the fuel must flow, and, further, there is no loss of balance through the gasoline swinging in the tank. On the opposite side of the engine, and also attached to the uprights, is the plain, copper-tube radiator.

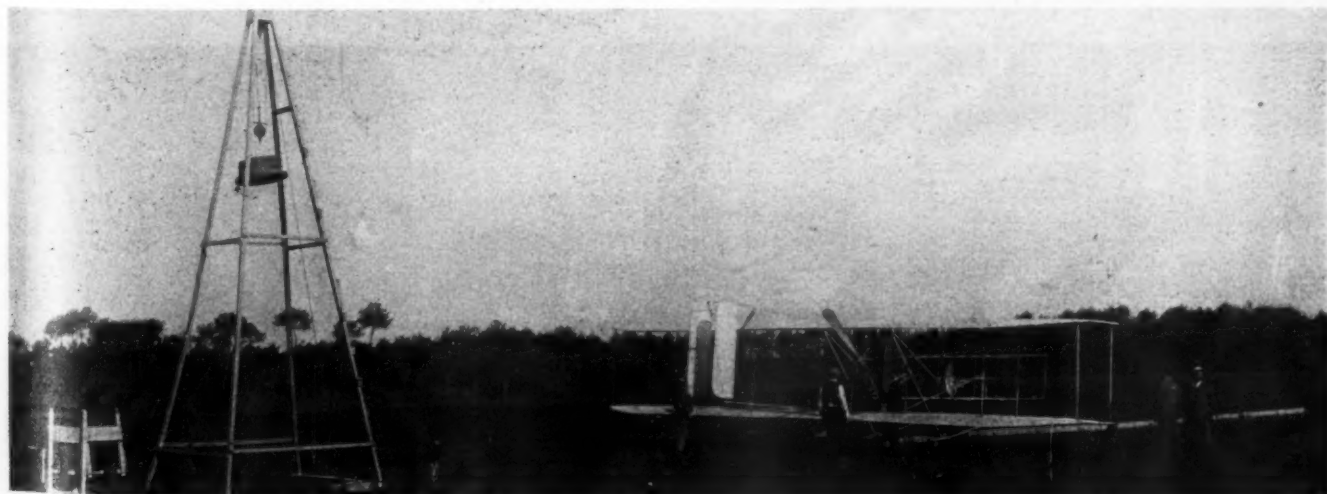
A start is made by placing the apparatus on a single wooden rail grooving into the bottom of the aeroplane. The catapult, as it has been termed, is a simple but effective method of starting, by means of which a rope is attached to the frame, carried forward round a pulley, then under and to the rear of the aeroplane to heavy weights raised and maintained some distance from the ground. On the weights being released the apparatus is violently shot along the rail, and flight occurs immediately.

At the time of starting the pilot is seated on the lower wing, looking forward, with the motor on his right hand. His feet project to rest on a cross beam, and in each hand he has a controlling lever. On the other side of the engine is the seat for a passenger, when one is carried. Control is somewhat difficult, for in addition to keeping the motor running, the pilot had to operate the forward elevation plane, the rear rudder, and the bending of the tips of the wings, one of the distinctive features of the Wright machine and one to which it owes much of its success. It will be readily understood that for one man the position is no sinecure. If a descent is made away from the starting

rail it is necessary to mount the apparatus on a small carriage and wheel it back to the rail, the aeroplane not being provided with wheels, as in the case of the French machines. Aeronauts here regard this as one of the weak points, but it would be more correct to see in it an evidence of the more natural conditions under which the Americans have worked, wheels being useless except on specially prepared grounds.

LE MANS, Aug. 22.—Wilbur Wright has had to move to larger quarters, the racecourse on the outskirts of the town being too small for the flights which he intends to undertake at an early date. Eight miles from the present field is the military ground of Auvours, on the Paris road, and seven miles from Le Mans. It is here that the longer flights will be made, permission having been obtained for the use of the ground and for the erection of a shed in which to lodge the apparatus. The construction of this latter has already been commenced. On the new ground it will be possible to make a flight of three miles in a straight line, a condition of affairs which will certainly be to the advantage of the aeronaut and will allow the more accurate measurement of distances covered. The Hunaudières racecourse is so small that the machine has to continually twist and turn.

Though the large tract of land at Auvours has been secured, it is possible that the smaller course will be maintained and that Wilbur Wright will fly across country from one to the other. The aeronaut himself has made no statement regarding this, but, according to Léon Bollée, who is in his confidence, it is being seriously considered. Two starting appliances are being erected on the Auvours ground at a distance of three miles. It is here that the two 50-kilometer flights, which have to be performed to win the \$20,000 prize, will be undertaken.



Showing the Famous Aeroplane with Its Unique Starting Device Ready for Action.



MORE scared than hurt comes pretty near to expressing retail trade conditions in New York during the selling season of 1908, now at an end for most dealers through the arrival of the 1909 models. New York was the storm center of the panic, and, being closest to Wall Street, was more thickly enshrouded in the atmosphere of despond that was the aftermath of the October crisis than other sections of the country. Then, again, Wall Street being near at hand is a temptation to which many New Yorkers yield, and when times are hard down there the sympathetic depression extends to no small proportion of the moneyed population. Further, "automobile row" gets many customers from those who have made lucky strikes in Wall Street. In times of money market depression and stagnation there is a cessation of buying, not only by the brokers, but also by those who dabble in stocks.

All this was against the buying of luxuries in general, and of automobiles in particular. In the face of all this, show time fears would seem to have been well founded. The outcome of the season, however, has proved the vitality and the permanency of the automobile as a sport and an industry. The results, conditions considered, have been amazing. The failures along Broadway have been insignificant in number and inconsequential in importance. Furthermore, a pretty complete canvass of "automobile row" discloses a gain in business for some, moderate profits for the majority, and an encouraging foundation for next year for all.

The panic came, happily, at a time which made it possible not only for the factories to temporarily curtail their production, but also for the dealers to trim their sails to meet any unfavorable wind that the panic aftermath might set to blowing. Consequently, makers did not try to overload their agents, and the agents put out orders for no more cars than the public

could safely digest. As a result, dealers will start on their 1909 campaign with decks clearer than they have ever been at the end of any previous season.

The panic about killed retail selling at the shows, which has always been a harvest time for New York agencies and branches. Business came to a standstill and so continued during winter. With the coming of the spring, however, business began to pick up, timidly at first; but with the arrival of May it was in surprisingly active swing, and by June was at its best. July and August have brought a lot of late buying, though some of it has been of the new crop of cars of the makers who habitually make their bow in midsummer. Much of it has been by buyers, who were well able to purchase cars earlier, but prudently waited for business conditions to cross the safety line and head once more toward the prosperity zone without dispute.

Dealers are looking forward to an early fall trade. New models will more generally than ever before make their appearance in September, which, with the shows put back again to January and no longer obstructing automobile buying, would seem to insure a good fall trade. Along with other business men, automobile dealers are looking forward to a prosperity boom in 1909, and the retail trade is showing its hope and confidence by largely increased orders. Dealers argue with good reason that many men who drove 1906 and 1907 cars in 1908 through prudent economy will exchange them for 1909 cars, and they believe that this considerable contingent of buyers, added to the natural increment of the normal growth of the use of the automobile, given free rein by a return of prosperity, will bring about the biggest business year the motor car industry has ever had.

This is what New York branch managers, dealers and others have to say of the results of 1908 and the prospects of 1909:





**Acme.**—W. H. Flinn, of Cordner & Flinn: "I have represented the Acme since last autumn. It was not, however, until May 1 that Mr. Cordner and I established the present agency. You see, we have a few 1908 and three new cars on the floor. We think so well of the prospect from what we have already done that we have closed for 1909 for New York, New Jersey, the western half of Massachusetts and England. In fact, we have already appointed English agents and expect considerable export business."

**Apperson.**—Sidney B. Bowman, of the Bowman Automobile Company: "Trade was slow until May, when business began to pick up and improve. It has been well enough sustained for us to have disposed of some fifty cars. We are arranging for half as many more for next season. We are laying great store by the 1909 Apperson line. It will include a 35-40-horsepower runabout with double ignition at \$3,000. We are also to have 25-30 chassis as a three-seated runabout or four-seated roadster with extension cape top at \$2,450, which should be a big seller."

**Autocar.**—Walter C. Evans, manager of the Autocar branch: "This has been a better year than last. I am expecting the new models in September. We are expecting big results from our new Type XVIII 18-horsepower chassis, which will be listed at \$2,000, including magneto and batteries. We are preparing to build town car, landaulet and victoria bodies to order for \$500 up. Two wheelbases will be furnished—97 and 85 inches. Commercial wagons of all kinds will be built to order on these chassis, which have a capacity of 1,500 pounds."

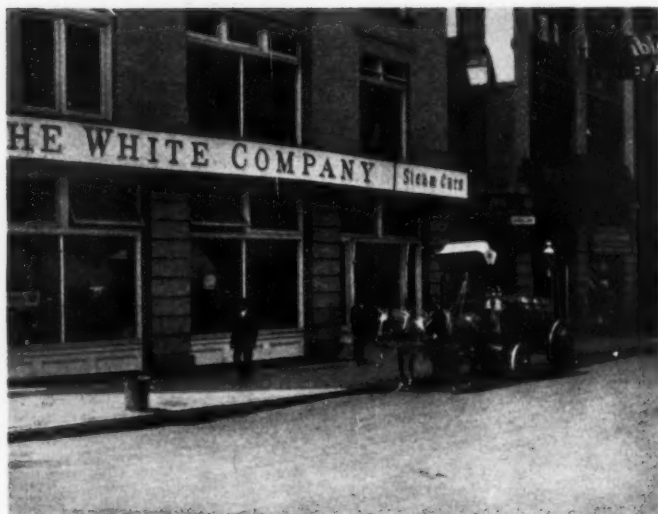
**Baker.**—Nathaniel Platt, manager of the Baker Electric branch: "We have done fairly well considering the business depression. The victorias and roadsters have been good sellers. The first of our new runabouts is now at Newport, where it is making a hit. It has a bonnet, and is good for 30 miles an hour. Our runabouts have been showing 90 miles on one charge. We expect another of the new runabouts here in two weeks. We are already taking orders for 1909 victorias and landaulets."

**Cadillac.**—E. H. Brandt, manager Cadillac Motor Car Company's branch: "I have only been here since July 2, but in that time I have sold sixteen single-cylinder cars and taken orders for thirty of the new \$1,400 four-cylinder machines. Our real campaign, however, will begin with our taking possession of our new building on West Fifty-ninth street on October 1. It will have an entrance on Columbus Circle. We will store and look after Cadillacs only. Mr. Leland has supplied our repair shop with the latest machinery and we have floor space for storing eighty cars, despite the fact that a 42 by 65 foot space on the main floor is given over to a showroom and the second floor to executive offices. Four-cylinder deliveries will begin in October and be at the rate of thirty per month for three months. After that we are promised all we can handle. We will go after night-hawks and independent drivers with taxicabs built on single-cylinder chassis, and you will soon see Cadillacs in that field."

**Chalmers-Detroit.**—Percy Owen, general manager Carl H. Page Company: "I have been a long time in the business, but I have never seen any new car arouse the public interest that has been created by the Chalmers-Detroit. We have actually had as many as 500 visitors in one day. A count one day showed fifty-eight people in the salesrooms at one time. Forty agents have already made applications for territory. Under these conditions, Mr. Page has been to Detroit and succeeded in having our allotment of cars raised to 400. Our district embraces Greater New York, Long Island, Westchester county and Northern New Jersey. We are promised twenty cars the first month, forty the second and sixty the third, which rate will thereafter be maintained. We have been taking retail orders thus early at the rate of five per day, so what will it be when the season is in full swing?"

**Corbin.**—H. D. Tucker, acting manager of the Corbin branch: "Mr. Hutchinson has been transferred to the factory





as sales manager and I have only just taken hold here. I have been connected with the branch, however, for two years and am pretty well acquainted with what has been doing here. We have sold 60 per cent. more cars than last year and have cleaned up our 1908 output. The factory, though, is putting through 100 more of Model K, which has a water-cooled motor. New York and Chicago have sold more water-than air-cooled cars. The results in San Francisco, however, have been just the reverse."

**Elmore.**—A. J. Robinson, of A. Elliot Ranney Company: "This has been the best season we have ever had with the Elmore. We were sold out completely by April 15. Since then we have been picking up cars here and there from agents. Our sales have been around seventy-five. We are expecting the first shipment of 1909 cars the first week in September. We have already taken orders for fifteen and expect to dispose of at least 125 cars."

**Fiat.**—E. R. Hollander, of Fiat Automobile Company: "We have put 110 cars through the custom house and have sold ninety-six or ninety-seven of them."

**Ford.**—Gaston Plantiff, manager of the Ford branch: "In June our branch did the biggest business in its history. It approximated \$240,000 and was for the most part made up of runabouts. We did not get our goods until late, the factory doing little until February. Since then we have had a good season. I don't think business in the aggregate has fallen off 20 per cent. I am speaking, you know, for the entire district handled from the branch. Out-of-town business has increased; in New York it has been somewhat quiet. Our territory extends to Trenton, Hartford and Albany. The



new models are promised in September. I may be over-enthusiastic, but the future looks mighty good to me."

**Franklin.**—Winfield S. Jewell, manager of the Franklin branch: "We have done, I think, fairly well, having disposed of a little over 100 cars. We have handled more of the big and fewer of the small cars than we did in 1907. We have gotten the list price and the freight for every one of our cars and have taken no cars in exchange. Our policy in this respect has been to sell a car for a customer. We have not paid a cent of commission to a sub-agent, a chauffeur or to any salesman not on our staff. We are expecting the new cars next week. Already fifty or sixty customers have notified us that they would buy 1909 cars. Some of them have already placed orders and made deposits."

**Garford.**—C. R. Teaboldt, sales manager of the Garford Motor Car Company, of New York: "We have cleaned up all of our 1908 models except two. In fact, we have done much better than we expected. Our 1909 cars are at the body factory being equipped, and will be ready in ten days. We are extending our line of agents throughout the district east of the Alleghenies."

**Glide and Jackson.**—George J. Scott, of the George J. Scott Motor Company: "We did well with the small cars, but the big models rather held fire. In fact, the small cars sold faster than we could get them. They are all gone. We have but one Glide and two Jacksons left over. They are in use as demonstrating cars. We expect our new Glides in September and our 1909 Jacksons in October."

**Haynes.**—E. W. Haddington, manager of the Haynes branch: "The last of our 1908 cars were disposed of this week. The business of this branch, despite the panic, has







been better than last year. We expected, being in New York, to suffer badly from the panic, but we have done well. In 1908 trade has been the best the Haynes company ever had. The new models are promised for September 10."

**Imperial.**—E. S. Watson, of Watson & Treadwell: "We did not start until nearly March. We only expected this season to lay a foundation for next year. The results have been good enough to encourage us to continue. This has been a second-hand year. We believe that 1909 will be a new-car season."

**Knox.**—H. M. Davis, manager of the Knox branch: "Our August business has been ahead of last year. The business men who laid off horses owing to hard times are looking up motor trucks. We are securing many orders from this class. Our pleasure vehicle business has also been ahead of last year's. We are now supplying agents with 1909 models and will begin deliveries to customers the first of the month."

**Locomobile.**—Ray Trowbridge, superintendent of the Locomobile branch: "Business has been favorable to us. We have sold fifty-five cars more than we did last year and have cleaned up our 1908 allotment. We have always been in a position to sell any cars that our agents might not be ready to take at the time specified in their contracts."

**Locomotive.**—James Joyce, manager of the automobile department of the American Locomotive Company: "High-priced cars were naturally most affected by the panic, but we have done better than we expected. Our taxicab business has been splendid and the success of this department has put it up to us to produce as many cars as possible. We are surprised how good our cabs are. Reports come to us of thousands of miles without a cent for repairs. We will build more touring cars

than ever next season. In fact, our factory has never been running so completely before. Every machine in it is at work."

**Lozier.**—C. A. Emise, sales manager Lozier Motor Company: "We have had a steady business since January 1, during which time we have sold from five to eight cars per week. Lozier registrations at Albany from January 1 to July 1 show an increase of 89 per cent. It must not be forgotten either that the prices of our cars range from \$5,000 to \$8,000. We had but three of our 1908 cars unsold on July 1 last. Our 1909 cars are selling at the same rate. For instance, we got rid of seven or eight cars last week. We could not have taken care of our business had it not been a panic year. We are going to prepare for next year, however, by building an addition to our factory."

**Maxwell.**—Col. K. C. Pardee, of Maxwell-Briscoe, Inc.: "We are ahead of last year in this branch, despite the panic. We have entirely cleaned up our 1908 allotment. Up to July the factory had turned out 3,000 more cars than last year, and we, of course, got our share of the increase."

**Mitchell.**—C. P. Skinner, of the Mitchell Motor Car Company of New York: "Business has been a hundred per cent. better than last year. We have sold eighty-eight cars. This was all we could get from the factory. We are looking for 300 cars next year. We are expecting our new models in September. We will be prepared to meet the new price competition with a 30-horsepower four-cylinder car, with magneto and selective transmission, which we will sell at \$1,500. The Albany registration shows a gain for the Mitchell of 127 per cent., the figures from January 1 to July 1 showing 193, to 85 for the same period in 1908."

**Moon.**—Charles A. Duerr, president Moon Motor Car Com-



pany of New York: "This company took the Moon agency on July 1 and since then has sold seven cars, all of them 1909 models. We are figuring on 100 the coming season and are promised shipments at the rate of ten per month."

**Mora.**—W. W. Burke, manager Mora Motor Car Company's branch: "I did not take charge of the branch until February 1 and the new factory was not completed until May, so I had no right to hope to do much more than establish the Mora in New York in a good position for trade another year. We have done what I should call a fair business, though we have sold more cars than were ever put out in the metropolitan district before. Our line for 1909 will embrace a 24 at \$1,850, and a 60 at \$2,750; both fours. We will also continue our six."

**National and Rambler.**—Fred E. Lee, sales manager Homan & Schultz Company: "We have so far done about 75 per cent. of the business of last season. This applies equally to Ramblers and to Nationals. It looks, however, like a late season. In the first place, those who thought themselves poor are now realizing that they are not. Then again, the shows do not take place until late and we are not talking of 1909 cars, which we will not get until the shows."

**Oldsmobile.**—Gen. John T. Cutting, of the Oldsmobile Company of New York: "We have done a much larger business than we had any right to expect under present financial conditions, and in view of the fact that we were delayed in receiving cars at the beginning of the season, owing to our factory having curtailed production during the panic months. Despite all this, we have sold three-quarters as many cars as we did in 1907, but that year we took more than we placed ordered."

**Packard.**—M. J. Budlong, manager of the Packard branch: "Our business in this season was way ahead of last year. It kept up prosperous at the factory, which turned out 300 more cars than it did in 1907 and will increase the output by several hundred in 1909."

**Peerless.**—John A. Clark, of the Peerless Motor Car Company of New York: "We sold the last of our 1908 allotment three months ago and since then have sold all the cars we could buy from other agents. We have doubled our order for 1909 cars. Customers are offering premiums for delivery before October 1. Our business this year was fully 50 per cent. above expectations."

**Pierce.**—R. W. Slusser, of Harrolds Motor Car Company: "Our manager, Mr. Garden, is away on his vacation, but I can tell you that we have sold all the cars the factory would let us have. The demand for the new cars, which will be out in October, is enormous. We are booking orders for them from photographs and blue prints. We think that as far as big orders are concerned 1909 will be a repetition of 1906."

**Pope and Matheson.**—A. G. Southworth, of A. G. Southworth & Company: "We have done exceptionally well under the circumstances. We ordered and disposed of the same number of Pope-Hartfords as last year, but you must remember that in former years we went beyond our allotment and got cars from other agents. More Mathesons have been sold in New York than ever before, but the former agent had a stock in hand, cut the prices and sold two to our one."

**Pullman.**—F. Cimiotti, of Cimiotti Bros.: "Our success dinner given early in the summer in celebration of our having disposed of an entire allotment of Pullmans, I think, will answer any question as to this season's business, and the fact that we have doubled our order for 1909 any query as to what we think of the prospects of the year to come."

**P. & S. and Simplex.**—C. A. Singer, of Palmer & Singer Mfg. Co.: "We did not begin to receive our P. & S. cars from our Milwaukee factory until June 15, so we are practically beginning the 1909 season. The factory has been turning out from seven to ten per week and we have had customers all the time awaiting their arrival."

**Rainier.**—Paul Lineberger, sales manager of the Rainier Motor Car Company: "We started to make 300 cars, but owing to the panic cut it down to 180. We have but three of

these left. Seventy-five per cent. of the cars were sold in New York and the balance by our agencies in Pittsburg, Los Angeles and Chicago. We are planning to build 250 cars."

**Renault.**—Paul Lacroix, manager American branch of Renault Frères: "The panic did not affect us. In fact, we did better than last year, when we sold 214 cars. We are already over that number, with several months of selling yet to come. I am expecting shortly a new 20-30-horsepower Renault built especially for American roads. It has ten inches' clearance and is lighter and shorter than the standard chassis. It has a 120-inch wheelbase and will sell, complete with runabout body, at \$6,000. Next year I will import a 10-horsepower runabout with 3x4 3/4-inch cylinders, to sell at \$1,500."

**Reo and Premier.**—R. M. Owen, of R. M. Owen & Company: "Our local business is a mere detail of our general selling. We have, though, done better in New York than last year. Our business in the country at large has not varied considerably from that of last year. We have been unable to get all the Premiers we wanted."

**Stearns.**—William Wurster, of Wyckoff, Church & Partidge: "Including cars sold by our branches in Boston, Brooklyn, Philadelphia and Baltimore, we have disposed of 160 machines. Registrations of Stearns cars in this State from January 1 to July 1 were ninety-four, as against forty-six in 1907, an increase of 104 per cent. These sales were practically all local. Our order for next year will be raised to 275 cars. Our contract is \$3,000,000 of Stearns cars in three years."

**Stevens-Duryea.**—Frank Eveland, manager of A. G. Spalding & Bros.: "We were without four-cylinder cars from October till June. During that time, though, we delivered 25 per cent. more six-cylinders than the year before. Since July 1 we have had the largest business in our history for July and August in selling and delivering of cars. We have had since July 1 many sales right off the floor, and now are making prompt deliveries of our four-cylinder cars."

**Stoddard-Dayton.**—R. S. Newton, of the Atlantic Motor Car Company: "Up to the panic in October, the 1908 cars, which began to come through in August, sold exceedingly well. Everything then fell off till Christmas and then grew gradually better. We sold forty-three cars in May, which was the best month for our business. Our trade as a whole has averaged up to last year's, despite the panic let-up."

**Studebaker.**—C. F. Reddin, manager of Studebaker Automobile Company branch: "We have doubled our sales of 1908 cars over the 1907 models. We are anticipating big business with our 1909 line, which is to include an autobuggy."

**Thomas.**—Harry S. Houpt, of the Harry S. Houpt Company: "Our business has been highly satisfactory, considering the panic. We are now doing a better business than we did at the corresponding season last year."

**Waltham.**—A. G. Bechtel, assistant sales manager of the Waltham branch: "Our selling season does not end until January, when the new cars will be brought out at the show, so you see we have four selling months ahead of us. We have closed out all our big cars and have only 50 of the single-cylinder buckboards left to be sold. Our two-cylinder buckboards have made such a hit that we have but six of them left."

**White.**—G. W. Bennett, district manager of the White Company: "In our territory we have sold within three cars of double what we did last year. In New York there has been a big improvement over last season. We have but six unsold cars in all our branches, so you see how well stock has been cleaned up in this district. During the entire panic I did not lay off a single salesman. In my opinion, 1909 will be the biggest year in the history of the trade."

**Winton.**—Charles M. Brown, manager of the Winton branch: "I have only been here, you know, since July 4. However, I have been looking in the books and can tell you that we have done more business in dollars and cents and sold more new and second-hand cars than in 1907. It must not be forgotten, either, that we have been up against a raise in prices from \$2,500 to \$3,500 and \$4,500. We have not only cleaned up on our allotment, but also drawn on other branches."



# WHAT IS THE BEST RELATION OF BORE TO STROKE?\*

By GERARD LAVERGNE.

BEFORE directly taking up this subject, which is one of considerable interest to designers and car owners alike, at the present moment, it will be well to go briefly into the subject of the power of the motor as a necessary preliminary, in order to show the importance of the stroke as a factor. To do this, we will take the formula of M. Witz, which is as follows:

$$P = 4Kp \frac{\pi D^3 L \omega}{4 \times 60 \times 75}$$

In which  $P$  represents the maximum output of the motor in horsepower, the formulæ and tables of the present article dealing with four-cylinder motors;  $K$ , the mechanical efficiency of the motor, which it is prudent not to estimate as being above 75 per cent.;  $p$ , the mean effective pressure per square centimeter of the explosive gases, expressed in kilogrammes, and  $D$  and  $L$ , the bore of the cylinders and the stroke of the pistons in millimeters,  $\omega$ , the angular velocity of the motor in r.p.m. But as the application of this formula would be found very difficult in practice, we have eliminated the mean effective pressure,  $p$ , the angular velocity and the stroke  $L$ .

The impossibility of conveniently determining the mean pressure causes us to drop it, though possibly by doing so we have neglected one of the elements whose influence would be the most interesting that could be shown. However, with equal compression and a similar method of ignition, and there is scarcely anything more standard than ignition by magneto, whether high or low tension, the m.e.p. of one motor is practically on an equality with that of another. We have based our elimination of the angular velocity and the stroke on the fact that they do not enter into the formula, except by their product,  $\omega L$ , and that, at an equal piston speed, when the stroke  $L$  is increased, the angular velocity decreases in such a manner that the product  $\omega L$  remains nearly constant. In fact, we have adopted the formulæ,  $P = 0.0028 D^2$ , adopted by the *Commission Technique de l'Automobile Club de France*, and  $P = 0.0025 D^2$ , recommended by M. Arnoux. Since that time numerous other formulæ have been proposed. The relation of the parabolic form is the following:  $P = K D^m$ , which, put in logarithmic

form, becomes  $\log D = \frac{1}{m} (\log P - \log K)$ , which may be represented graphically by a straight line, of which the angular coefficient is  $1/m$ , and of which the point of contact with the axis of the abscissæ furnishes, on the logarithmic scale, the value of  $K$ .

Carrying on the abscissæ and the ordinates, respectively, the values of the decimal logarithms of the powers and bores (the logarithmic scales, written the length of the two axes of the coordinates, permitting the direct reading of the values of the powers and bores corresponding to any point on the diagram), it will be found that the relative points of 105 four-cylinder motors are almost all comprised within two lines corresponding to the parabolas having for their equations respectively:

$$P = 0.044 D^{2.7}$$

$$P = 0.167 D^{2.32}$$

Owing to its clearness, this diagram may be utilized to advantage for the study of the comparison of the experimental results relative to different types of motors.

Unfortunately all formulæ of the type  $P = K D^m$ , not taking into account anything but the bore, and in which, in every case, the influence of the elements,  $K$ ,  $p$ ,  $\omega L$ , is not present except in a numerical coefficient, is not exact. It will suffice to make this clear, to recall that we have taken, in order to eliminate the elements  $\omega$  and  $L$  from the Witz formula, the constance of the product  $\omega L$ , which is itself based on the constance of the linear speed of the piston. If we now refer to the table given by M. Arnoux in his article *The Predetermination of the Maximum Power of Explosive Motors* (published in *THE AU-*

*TOMOBILE* of January 24, 1907), we can extract Table I, which we have completed by the addition of the piston speeds and relation of the bore to the stroke. We can see from this that the piston speeds vary from 3.62 meters to 8 meters per minute, and that it increases with the bore and power of the motor. While this factor varies in the ratio of 1 to 2.2, the r.p.m. rate (if in M. Arnoux's table the single exception with a speed of 950 r.p.m. be omitted) only has a range of from 1,100 to 1,650, or a ratio of 1 to 1.5.

The product  $\omega L$ , under such conditions, would have, in the case of motor No. 1 of the table, the value  $3.62 \times 1,450 = 5,249$ , and in the case of motor No. 26,  $8 \times 1,200 = 9,600$ . Its constance may be judged from this, and at the same time the importance of taking the stroke into consideration when calculating the horsepower of a motor may be realized. This is so well understood that many authors have proposed formulæ in which they have neglected the influence of the angular velocity, while giving particular importance to the stroke  $L$ . In 1904, M. Favron proposed the formula,  $P = 0.007 D^m L^n$ , in which it is necessary to have  $m = 2.1$  to 2.15, and  $n = 0.6$  to 0.8, according to the results of experiments with a series of Aster motors, having bores ranging from 80 to 140 mm. Later, and

TABLE I.

Data Concerning a Number of Four-cylinder Motors.

Brake H.P.	R.P.M.	Piston Speed Metres per Sec.	Bore, mm.	Stroke, mm.	Bore to Stroke.
10	1,450	3.62	65	75	1.15
12.5	1,600	3.66	65	70	1.07
20	1,400	5.60	90	120	1.33
18	950	4.11	90	130	1.44
22.5	1,500	5.00	90	100	1.11
24	1,600	5.06	90	95	1.05
33.5	1,350	5.85	104	130	1.25
31.8	1,250	5.00	104	120	1.15
27.7	1,550	5.68	104	110	1.05
25.4	1,500	6.00	104	120	1.15
43	1,250	5.83	120	140	1.16
40.5	1,150	5.55	120	145	1.20
47	1,300	5.63	120	130	1.08
52	1,350	5.49	120	122	1.01
67	1,300	6.28	140	145	1.03
70	1,380	6.44	140	140	1.00
60	1,150	6.13	140	160	1.14
63.5	1,260	6.30	140	150	1.07
76	1,400	6.44	140	138	0.98
82	1,250	6.66	155	150	1.03
92	1,400	7.00	155	150	0.96
79	1,150	6.13	155	160	1.08
85	1,350	6.75	155	150	0.96
86	1,250	7.16	160	172	1.07
96	1,300	7.15	160	165	1.03
101	1,200	8.00	160	200	1.25
101.5	1,350	6.20	160	140	0.87
90	1,250	7.08	160	170	1.06
80	1,200	7.20	160	180	1.12
105	1,350	7.11	160	158	0.98

Comparative Data of a Number of Motors.

in order to avoid the employment of logarithms, he proposed the substitution for the preceding formula of the following:  $P = 0.007 D^2 L^{0.5}$ . But as both the application and the accuracy of the last are not as great as those of the first formulæ, he developed in 1907 a short rule of calculation which permits of directly reading the results of the better formula. M. Faroux successively proposed  $P = 0.00002956 D^2 L^{0.6}$  and  $P = 0.00002956 D^{2.3} L^{0.7}$ . However that may be, the influence of the stroke has been sufficiently demonstrated, and it is the purpose of this article to study the latter.

## Theoretical Inconveniences of a Long Stroke.

We will begin by taking up the disadvantages of a long stroke, the following of which are irrefutable:

1.—The long stroke necessarily increases the space occupied by the motor, which is naturally not an inconvenience in the case of the stationary motor, on which it is universally regarded as advantageous. It is likewise for the automobile motor, but the latter is always mounted vertically on the forward part of the car (the horizontal motor unjustly proscribed by fashion would avoid this objection). In fact, it has been calcu-

\*Translated from *Omnia*, Paris, by Charles B. Hayward.

lated that a four-cylinder motor of 155 mm. bore, such as those which lined up in the recent Grand Prix race, would, if given a stroke of 240 mm., probably a great advantage in both power and efficiency, have resulted in a car with a bonnet about 1.60 metres above ground, an excess of elevation of the center of gravity which would have evil consequences on its stability.\*

2.—The increased length of the stroke and that of the crank (equal to one-half that of the former), if transformed, with the same connecting rod, into an increase in the latter's angularity, with the consequent necessity for a greater offset.

3.—It increases the weight of the motor, and as a result diminishes its power per pound.

The *Commission Technique de l'Automobile Club de France*, in the preparation of the program for its races for motors of high power for weight, made a special investigation of the motors of a number of builders. The results were published in the form of a table and a diagram. From the former we have extracted our Table II, in which the sixth column gives the weight of the motor, including that of the carbureter, ignition system complete, starting crank, water pipes, radiator with water reservoir, grease cups, etc., but without the weight of the inlet manifold, exhaust piping, water, gasoline, oil or grease. The motors are classified in the order of their descending power for weight (*puissance massique*). We there see that among the first five there are three comparatively short motors and two "square"; then there are several long motors, and the eleventh is really short. However, after a general fashion the table clearly proves that the weight per horsepower increases with an increase in the stroke, and experience verifies this deduction.

TABLE II.

Weights of Motors	Stroke, mm.	Bore to Stroke.	per Horse-power from Data	Supplied by	Makers.
Bore, mm.			R.P.M.	HP.	Wt. Kilos. Wt. per HP.
170	150	0.88	1,300	102	370 3.62
150	150	1.00	1,000	80	300 3.75
180	98	0.94	1,100	127	480 3.78
160	160	0.61	1,300	95	395 4.15
160	160	1.00	1,100	90	380 4.22
155	175	1.12	1,100	100	450 4.50
145	160	1.10	1,360	84	412 4.90
102	116	1.13	1,460	37	233 6.29
129	140	1.16	1,200	44	300 6.81
120	140	1.16	1,200	60	420 7.00
150	138	0.92	1,200	70	497 7.01
110	130	1.18	1,500	43	311 7.24
112	130	1.16	1,200	38	368 9.68
110	120	1.09	1,100	35	350 10.00
110	130	1.18	1,300	35	353 10.08

Weight per Horsepower Compared with Other Factors.

On the other hand, it is not necessary to exaggerate the importance of inconveniences attendant upon a long stroke. As we have already mentioned, the weight of a motor from which its weight per horsepower is calculated does not comprise the weight of its supplies, and particularly that of gasoline. But long-distance touring cars must carry a tank sufficiently large to make frequent replenishment unnecessary. As an offset to this, as we will show later on, the short motor does not utilize so effectively the results of expansion as does the long motor, and should consume more than the latter. If, then, it is desired that with the short motor the necessity of refilling the tank should occur at the same intervals as with the long motor, it will be necessary to increase its volume and weight. But, everything considered, the weight per horsepower of the motor-tank group should be about as great with one as with the other.

4.—In lengthening the cylinder and, in consequence, increasing the piston speed, the duration of the various phases of the cycle, and particularly that of combustion and expansion, the long motor increases the length of the cooling jacket, with the consequent heat losses that this entails, so that the calories contained in the combustible are not as effectively utilized.

For a long time past M. A. Witz has called attention to the striking influence of the walls of the cylinder on the efficiency. Following experiments made with a motor, in which the piston speed under the action of the explosive mixture could be in-

\*Experience has shown that for racing cars, the connecting rod should be four times as long as the crank; an increase of but 20 mm. in the stroke is attended by an increased height of the motor of 100 mm.

creased or moderated at will, he demonstrated that the cooling of the gas in contact with a wall more or less hot, modified the order of combustion and expansion. By reducing to the greatest extent possible this cooling action, the efficiency of the motor is increased; the calories drawn from the combustion cycle by the cold water and wasted in the air are diminished. It is expedient, then, to have the motor function with the cylinder walls as warm as possible in order to effect the combustion and expansion in the minimum period, which cannot be done with the long stroke, assuming the same piston speed.

But since the question here is one of time, by increasing the speed of the piston (and this is what justifies the notable variations appearing in Table I), this disadvantage of the long stroke disappears, and, it must be added, this is the only one that presents itself from the point of view of theoretical heat efficiency. This naturally leads us to a study of its advantages.

#### Theoretical Advantages of a Long Stroke.

1.—By increasing the duration of the various phases of the cycle, with an equal piston speed, the gaseous mixture becomes more intimate in the carbureter, in the manifold, and in the cylinder, where it remains a longer period (it is true in greater mass, as the cylinder is larger); the ignition and combustion take place under better conditions; finally, and above all, the expansion is more integral, the calories utilized more numerous, and those rejected to the atmosphere with the exhaust gases of less importance. The exhaust is more effectively accomplished, and the combustion chamber emptied to a greater extent, thus permitting of a larger charge of fresh gas being aspirated in the same period of time.

2.—From the viewpoint of mechanical efficiency, the long stroke is also an advantage. The resistance offered by the moving parts of the mechanism should, in fact, be calculated with reference to the maximum stresses they are called upon to endure in the form of pressure exerted on the head of the piston by the explosion. On the other hand, it is not the maximum pressure so much as the mean effective pressure that determines the power, and it may be said that the mechanism is being utilized to a greater degree when the maximum and mean pressures are close to one another. In the majority of motors their relation is equal to 15; it is too great, and in diminishing the surface of the piston and increasing its stroke this is diminished also, making a much smoother running motor.

3.—With an equal density of mixture, the same volume of the combustion chamber in which the compression takes place, the latter is, for a given bore, proportional to the stroke of the piston. The advantages of high compression are well known:

(a.) It raises the temperature of the mixture before ignition, rendering the latter more prompt and integral, and with it the more complete combustion and utilization of the fuel.

(b.) Compare the diagrams of Fig. 1, taken on the same motor, with the same combustible mixture and operating with a constantly increasing compression: 2.70 kilogrammes; 4.25 kilogrammes, and 5.40 kilogrammes per square centimetre. The line of the card showing the explosion is heightened and lengthened as the compression increases. The pressure at the end

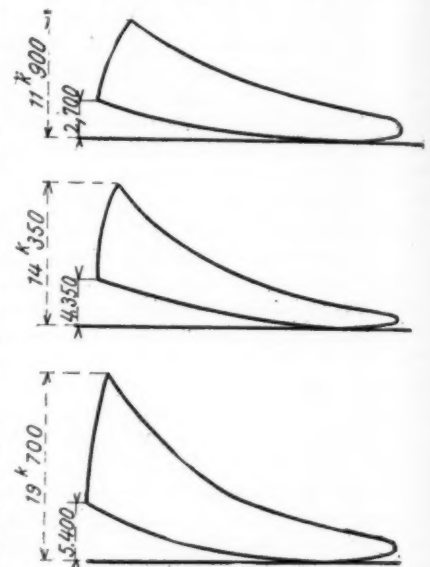


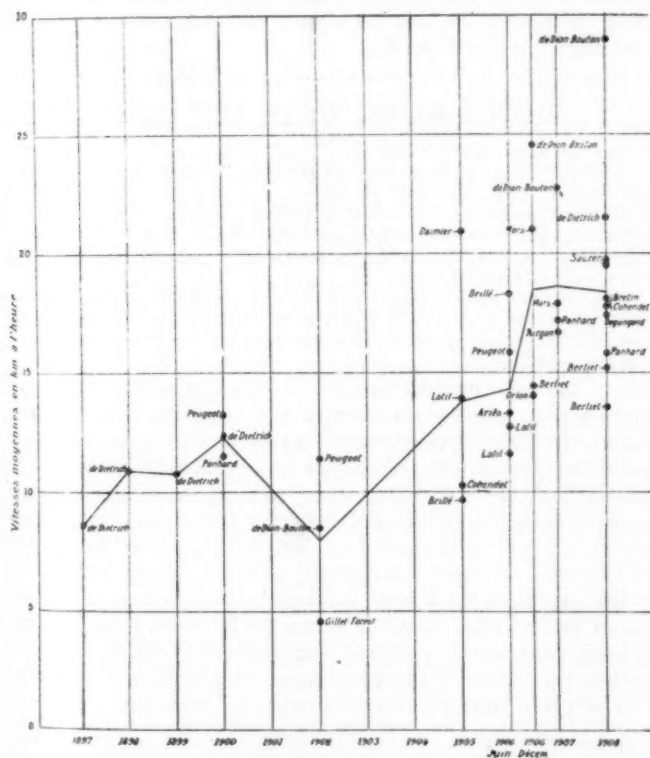
Fig. 1.—Effect of Increasing Compression.



of the stroke has the respective values of 11.90, 14.35 and 19.70 kilogrammes, and the mean pressure 5.04, 6.0, and 6.94 kilogrammes. The area of the diagrams, representing a measure of the indicated power, follows an analogous progression. It is the same with the indicated efficiency, since the mixture introduced only varies in volume, and not in nature, and with the same expense of fuel a greater amount of work is obtained.

(c) The increase in the compression decreases, as we have already said, the duration of the explosion, permits of giving the piston a greater linear speed, and shortens the duration of the cooling effect, combining the advantages of slight cooling and long expansion, and overcoming in this manner the sole objection which we have made on the latter score, from the point of view of thermal efficiency.

But what degree of compression should be adopted? M. Marchis has estimated that 2.5 to 5 kilogrammes per square centimeter, which represents present practice, could readily be increased to 6 to 7 kilogrammes without modifying to any extent the essentials of the motor. The latter figure may be slightly exaggerated, and, in fact, high compression becomes useless when it can only be employed by an excessive dilution of the mixture to avoid auto-ignition. Customarily 13.5 parts of air are mixed with one of gasoline, and it seems that the proportion could be carried to 15 to 1 with advantage, and then the compression could be raised to 6 kilogrammes without any fear of auto-ignition. However, as a high compression renders the recovery of the motor more difficult, it will be more prudent to adopt as a standard for the touring car a compression of 5 kilogrammes per square centimeter.



Illustrating Increase in Mean Speeds in Kilometers per Hour.

4.—For a given piston speed the long motor will wear less than the short one, for the very good reason that there are fewer reversals of the movement of the piston and connecting rod—reversals that are always sudden and which tend to disrupt the mechanism. The long stroke and the smaller number of turns also diminish the friction, and should increase the efficiency.

5.—A motor having a high angular velocity is more difficult to regulate than a motor with a less number of r.p.m. The reasoning *a priori* can clearly be concluded in favor of the long motor.

What is the teaching of experience on the subject? A short motor, having a bore of 152 mm. and a stroke of 110 mm., with a piston speed of 7.33 metres per second, turning over at about

2,000 r.p.m., develops 100 horsepower. In one minute it aspires 1,000 cylinderfuls, or 8,000 litres, of carbureted mixture, equivalent to 80 litres per horsepower minute. A long motor, having a bore of 130 mm. and a stroke of 150 mm., with a piston speed of 6 metres per second, turning over at about 1,200 r.p.m., aspires 600 cylinderfuls per minute and develops 70 horsepower. The consumption per horsepower minute is but 68 litres.

M. Faroux reports that a well-known manufacturer of light cars, wishing to decide upon a single-cylinder type of 100 mm. bore, constructed several varying types and submitted them to severe comparative trials. A stroke of 140 mm. gave 14 horsepower, which was considerably better than dimensions of 100 by 120 produced. By further increasing the stroke to 150 mm. the power increased to 15.5, and finally a stroke of 170 mm. produced 18 horsepower, with a slightly decreased consumption per horsepower hour than was the case with the 100 by 140 motor, which gave but 14 horsepower. Accordingly, experience may be said to substantiate the theoretical deductions. We will show later the results obtained by recent Grand Prix cars.

## ROLLER BEARING AXLES FOR HEAVY TRUCKS

Among the products that are being brought out for the season of 1909 by the Timken Roller Bearing Axle Company, Canton, O., for business wagon makers is a line of heavy roller-bearing axles specially designed for heavy commercial work. As in the lighter models turned out by the same company, the object has



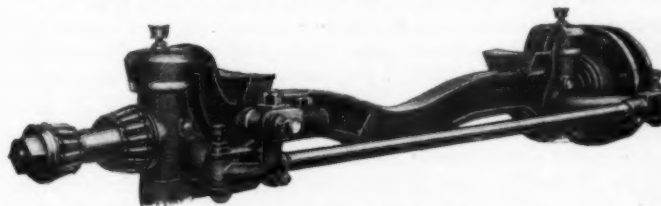
Plan View Showing Range for Seating Spring Centers.

been to provide an axle in which friction has been reduced to a negligible quantity; in other words, one that will have the greatest carrying capacity per unit of bearing, and one that will withstand both radial load and end thrust without the use of extra bearings to take care of the latter. This new axle, which is illustrated by the accompanying cuts, is of the I beam type of 2 1/2 by 4-inch section, and is equipped with Timken roller-



Medium Weight Axle for Commercial Work.

bearings in the steering heads, universal steering joint connections and large knuckles of the Elliott type, hardened and ground steel bushings, grease cups and other necessary fittings. It is designed to carry a load, including the truck, of 18,000 pounds. The top view of this new axle shows the great range of centers for seating springs that is provided, the pads being forged in-



Heavy Type Timken Axle for Large Trucks.

tegral with the axle, while the seats can be located where desired. The attention now being paid to special parts for the commercial vehicle affords excellent evidence of the increasing demand for cars of this type and for all classes of service up to the heaviest, in which the parts must be unusually strong.

## LETTERS INTERESTING AND INSTRUCTIVE

### FOCUS OF ACETYLENE HEADLIGHTS.

Editor THE AUTOMOBILE:

[1,516.]—I have been much annoyed lately by a very mysterious trouble affecting one of the acetylene headlights on my car, and there is nothing that I can think of that even suggests a method of remedying the difficulty. If your knowledge will help me out, I certainly will greatly appreciate having the benefit of it. The derangement is confined to one lamp, of the two that are fed from a single generator, and causes the light from this lamp to slant upward, so that it does not strike the road at all, except in coming from a level onto a hill. The result is that the lamp, though it gives a good light, throws this light in such a direction as to make it practically useless for driving. I thought at first that the reflector, which is of the usual glass kind, might have become tilted or displaced, but there are no signs of this, the lamp being of very substantial construction, with heavy brass parts holding the reflector securely in place. Is it possible that the reflector could be in any way warped from the heat of the flame?

Birmingham, Ala.

JOHN W. FEENEY.

The difficulty appears to be due to the position of the flame, which must be slightly below instead of directly in the focus of the lens mirror, where it should be. A fore or aft displacement away from the focus would have the effect of spreading the beam, but from your letter we infer that the beam is fairly concentrated, only projected in the wrong direction, showing a displacement of the flame in a plane at right angles to the axis of the mirror. A possible cause of the displacement may be in the recent replacement of the burner tip with one that starts too low for the lamp. But a more likely cause—one that often gives the symptoms you describe—is a weak flame, due to the clogging of the burner openings. In such a case the center of luminosity of the flame will be materially lower than the normal, with the result that the light rays strike the lens at such an angle as to be reflected too high. The remedy is cleaning the burner with a fine wire, or better still, to replace it with a new one.

### QUERIES ON TWO POINTS OF INTEREST.

Editor THE AUTOMOBILE:

[1,517.]—I should like some enlightenment on the following two subjects: (1) Why will spark plugs miss fire with a gap of 1-64 inch, and fire regularly with a gap of 1-32 inch?

(2) I have been awaiting information asked some time ago by a correspondent owning an Autocar, regarding the so-called "puddle" carbureter (probably the 1908 Holley). What can the Ford run-about owners say about them?

Somerville, Mass.

SPARK GAP.

Do you mean why does the spark plug miss fire, or why does the cylinder in which it is located fail to fire its charge when the spark plug in it has the smaller gap? In the latter case, we should say it was a case of the mixture and not of the spark plug alone. In other words, the spark caused by the current bridging the smaller gap is not sufficient to fire the mixture in the cylinder, whereas the 1-32-inch spark is. It must also be borne in mind, that the spark which actually takes place in the cylinder is nothing like as large as that which is seen when the current is caused to bridge the gap of the plug in the open air. This is because of the greater resistance of the mixture in the cylinder, due to the increased compression. The spark which occurs when the points are only 1-64 inch apart, may appear strong and sufficient in the open air, but it is much weaker when subjected to the compression in the cylinder, and is probably reduced to a point where it does not raise the temperature of the gases immediately surrounding it to a point where they will ignite with the small spark caused by the gap in question. It is not that the current fails to create a spark at the gap, but the spark thus made is insufficient.

We again call the attention of our subscribers to your second query and trust that some of them will come forward in the near future with the desired information.

### FORMULA OF THE ALGONQUIN HILL CLIMB.

Editor THE AUTOMOBILE:

[1,518.]—Will you kindly enlighten me in your "Letters Interesting and Instructive" how the efficiency of an engine may be arrived at by using the Chicago Motor Club's formula, which they employed at the hill-climb at Algonquin, August 15? I believe they multiply the cylinder displacement by the time made on two hills, and divide the result by the weight of the car, including the driver, S. E. T.

Your information concerning the formula is correct, with the exception of the first item, which should be the piston area, instead of the cylinder displacement. Assuming the same mean effective pressure, the power of the engine increases as the square of the diameter of the bore, in other words, the piston area, so that this has been taken as the factor representing the power of the motor. Hence, we have in the formula in question, the product of *power* by *time*, divided by *weight moved* through a given distance, the result of which is the measure of efficiency of the car. Of course, it can only be approximate owing to the important factor of power being a variable that may differ very greatly. Nor does it take into account the personal equation in the shape of the driver, as skilful handling may make several seconds difference in the time required to ascend the hill, but this of course is something that could not be equalized by any method of calculation, so that taken all in all, the formula may be said to work out equally well, in favor of all the competing cars, particularly as the latter are classified according to size and power as a preliminary.

### MOTOR MISSES WHEN RUN LIGHT.

Editor THE AUTOMOBILE:

[1,519.]—Will you please answer through "Letters Interesting and Instructive" the following questions: I have an opposed 5 by 5 automobile motor, water-cooled, which pulls good under a load, but going down hill it will miss half of the explosions. Also misses when running idle, but give it the throttle and it fires all right. What is the cause of this?

What is the cause of the outer casings cracking at the clincher? Same are 32 by 4, and have only run 723 miles. Car weight is 2,000 pounds. They have never been punctured.

Adrian, Minn.

R. H. DOE.

It seems quite evident that it is not getting sufficient gasoline when running light to enable it fire regularly. Either open the gasoline needle valve slightly or correct the air adjustment so that it does not get too much air when not under load. The reason that it fires regularly when running loaded is due to the greatly increased suction exerted by the pistons and, as a consequence, the increased amount of fuel that is drawn through the nozzle. We do not know exactly what to ascribe this failure of the tire to, without more information, or, in fact, a view of one of the casings. Speaking generally, however, it may be due to having run the tire without being properly inflated, and may actually be a form of rim cutting. Or it is possible that it may be a defect in that particular casing.

### WHAT IS MEANT BY A HORSEPOWER?

Editor THE AUTOMOBILE:

[1,520.]—If it is not too much trouble, will you please tell me what a horsepower is? Also how far it is by road from Mahanoy City, Pa., to Chicago, Ill.? I was referred to you by the editor of "Popular Mechanics."

ANDREW DEMEETER.

Shenandoah, Pa.

Horsepower is a rate of performing work, the foot-pound being the unit of work. James Watts figured that a horse was capable of lifting 33,000 pounds one foot per minute, or in other words, of performing 33,000 foot-pounds of useful work per minute, and he established this as a standard which has since been universally followed.

The distance from Mahanoy City, Pa., to Chicago, Ill., depends very largely upon which way you would go, as it is

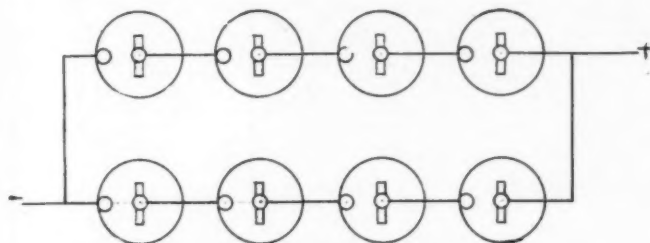


possible either to start northward toward Elmira or southward toward Harrisburg or Altoona, in each case connecting with a trunk line highway to Chicago. An average would put the distance between 800 and 900 miles.

### OLD NEWSPAPERS AS AN AID TO TOURING.

Editor THE AUTOMOBILE:

[1,521.]—I have found it a good plan to always carry several newspapers in the car when touring. If the rear wheels start to spin round in a muddy spot, a couple of newspapers spread over the mud will often enable the rear wheels to climb out, thus avoiding the necessity of putting on the chains in an unpleasant place. Newspapers will also be found handy when any adjustments have to be made under the car.



Series-Multiple Wiring of Dry Cells Increases Mileage.

I have been able to obtain much greater mileage from four dry cells than from six dry cells, wired in series. When six cells are used, a much greater current is forced through the coils, which rapidly exhausts the batteries and also causes pitting and burning of the platinum contact points. If one wishes to use more cells it is better to connect them in series-parallel, i.e., two groups of four cells, connected in multiple, as shown by the accompanying sketch. When connected in this manner, they last quite a while. Allegheny, Pa.

MURRAY FAHNESTOCK.

The use of newspapers for the purpose of protecting one's clothing and of saving as much of one's temper as possible, when it is compulsory to stay for any length of time underneath the car is such a simple expedient that it can well be recommended to those who tour. Even where there does not happen to be any mud present, it saves the necessity of having to brush a goodly coating of road dirt from one's clothes, and doubtless even an experienced chemist would be surprised to find the number of undesirable constituents to be found in road dirt.

This form of connecting up dry cells has long been recommended by builders of cars, and the manufacturers of dry cells themselves, and we have also always taken pains to point it out to those who complain of poor service from dry cells. Connecting them in series multiple in this manner, as shown by your sketch, is merely providing a factor of safety which prevents the cells from being overworked constantly, and which also permits them to deliver their output at a rate better suited to their capacity, and in this way their active life is greatly prolonged.

### TO PREVENT GRADE CROSSING ACCIDENTS.

Editor THE AUTOMOBILE:

[1,522.]—I notice that in spite of the great number of recent accidents at unguarded grade crossings and the resulting, yet resultless, talk that has followed, these accidents still continue. I would like to propose a new scheme, which, though cheap in itself, would not allow this wholesale loss of life to continue. By placing this in your "Letters Interesting and Instructive," I believe that it will receive due attention from all those interested. Leaving at the railroad tracks the present T sign, "Look out for the cars," I propose that on each side of the crossing, at from a half to a quarter mile out from the railroad tracks, a similar, or some conspicuous warning, sign be placed so that automobiles going in either direction will notice it. Then, at no matter what rate the machine is going, the driver, seeing the sign, will have sufficient time to slow down and have the machine under perfect control when the sign by the tracks comes into view. Then one of the party could get out, cross the tracks, and signal the driver to come ahead or not, just as the conductors on the trolleys do.

Under present conditions, where they try to remedy the danger at a place where the road makes a sudden bend and hides the crossing till just upon it, by placing a flagman there—even if they put gates there—the driver will have no more of a chance to escape

the danger than if no man was there. In the nighttime a red light or some illuminating scheme to light up the sign could be placed on the first post. For a few cents a week some resident nearby would willingly attend to the lamps. Then another lamp on the post by the tracks will show the motorist where the tracks are. In this way, be it night or day, he no longer drives along ignorant of danger ahead.

If the automobile clubs would get together, they could easily make railroads, the county or townships—whichever is responsible—place these signs on the roads. Why not let the clubs start in immediately themselves and set the example? It certainly would be much cheaper than putting men at the crossings and installing gates; the cost would be comparatively nothing. Surely human life is worth that much. For those reckless and heedless drivers who have more than harmed the reputation of the motoring public, should they continue their reckless pace and ignore such warnings and signals as they do the law, then let them dash on to that dreadful, inevitable, yet deserving fate. AUSTIN M. WOLF.

New York City.

### REDUCING THE DANGERS OF TRACK RACING.

Editor THE AUTOMOBILE:

[1,523.]—As it is reported that more automobile races are to be held on the present horse tracks, it may be that a suggestion as to a method which, in the writer's opinion, would greatly reduce the danger attending such races, will be of interest. If track racing accidents are investigated it will be found that in most cases the trouble was caused by the vehicle, after leaving the track at a turn, dashing into either spectators, fences or trees or running over banks, and that had the driver sufficient cleared ground outside the track to have brought his vehicle under control after leaving it and before the obstruction or danger point was reached no disastrous results would have followed. It will also be found that even those few accidents due to collisions or breakage of parts might have, in a large measure, been prevented from having serious results if the driver had a place outside of the track which he could have run on to in an emergency. It is believed that the danger of reasonably restricted automobile races upon horse tracks could be reduced by means of the suggested cleared ground to such an extent that it would not be greater than that on a specially constructed track where races were held without restrictions.

The cleared ground should always extend around turns beyond the commencement of the straight parts at both inside and outside of the track. It need not be exactly level (if banked so much the better), and should be left soft in order to check a vehicle running on to it quickly as possible. There should not be any gutters that might upset a machine between this cleared ground and the track and all spectators should be kept off of it. This latter, it is thought, would be comparatively easy, as the principal reason why spectators persist in getting close to the track at present is the fact that the fences, usually near its edge, not only obstruct the view of anyone some distance back from them, but also form a very advantageous support to sit or lean on. If fences are necessary, they should be as far as possible from the track at the curves, so as to both be out of the way of any automobile that leaves the track and to render it unnecessary to attempt to drive the spectators back from them.

In closing, the writer would say that he would like to hear of other methods of reducing the danger of track racing, as by a discussion of the subject it may be possible to reach some inexpensive plan which will make it at least as safe as other sports and which will enable the holding of race meets, and particularly 24-hour races, without fear that they will be marred by serious accidents.

A. E. OSBORNE.

New York City.

### JERSEY SEASHORE TRAPS WORKING FULL BLAST.

Editor THE AUTOMOBILE:

[1,524.]—Would you please inform all your readers that intend coming to Asbury Park and other points on the Jersey coast to drive with care, as there are police traps from Red Bank, N. J., to Point Pleasant? As far as I can find out, from Sunday to the present time there have been some 80 arrested and fined. In Point Pleasant they fine them for exceeding 10 miles per hour. Some got fined when found they were going only 12 miles per hour.

It's the same old story; the speeders get away and the more careful and sane users of the road have to stand for all the bad that the reckless drivers did this Summer. Right here I would like to appeal to all users of the automobile to drive with care and cut out the road racing. If you don't it will be only a short time till we will have to quit autoing in the country, as the small towns are going to make it hot for us. There is no use in saying they cannot do so, because they can; as some found out Sunday around here as it stands now. Every time we go out we are in fear of arrest, and if that feeling is caused to be kept up, it is going to kill autoing for pleasure.

Asbury Park, N. J.

R. A. C.

## POINTS OF INTEREST TO AUTO REPAIRERS

As a rule, all threaded connections in the gasoline line should be soldered, as this is the only way to insure their permanency. Occasionally, however, it is inconvenient or undesirable to solder such a connection, and in that case other means must be taken to insure its tightness. Dry soap is frequently used for such joints. A better substance, however, is a hard paste of soap and fine emery. The emery cuts the threads and permits the joint to be screwed together further and tighter than soap alone, while making a joint that can easily be taken apart.

One of the accompanying illustrations shows a handy wrench, which can be made in a few minutes from a scrap of  $\frac{1}{8}$  or

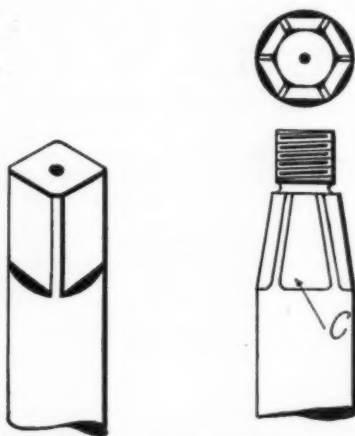


Homemade Gasoline Valve Wrench.

3-16-inch flat iron stock, for gasoline valves having squared stems unprovided with a handle or wheel for turning them. By shaping the end as illustrated, the wrench is easily guided to the correct position on the stem, even when the latter cannot be seen and the valve has to be closed by feeling only. A strong string or bit of chain may be run through the wire ring and secured with a few inches of slack to the valve itself, thus making the wrench always handy when it is wanted.

### Filletting Shafts with Squared Ends.

A shaft to which a gear is attached by a squared or hexagonal section at one end is obviously weaker at that end than elsewhere, unless the end has been enlarged so that the diameter over the flats is equal to the diameter of the round part of the shaft. In some cars this precaution has been overlooked, and the flats are milled off from the round contour of the shaft, which is thereby reduced in section. Among the parts in which this construction will be found are the live axle shafts, the differential shafts of a chain-driven car, the bevel pinion shaft of a live-axle car, and the shafts to which the propeller shaft universal joints are attached. A shaft containing no more than 40 "points" of carbon, or a nickel or chrome nickel steel shaft, will twist noticeably before it breaks, provided it has a chance. If the rear axle is of the floating type, the squared ends of the shaft will be a loose fit in the differential gears and the wheel hubs, and there will probably be  $\frac{1}{8}$  inch or more where the squared portion adjoins the round, where this twist will appear. If at this point there is a well-defined shoulder, *A*, the fracture when it comes will take place at the shoulder, and it will probably occur a good deal sooner than if there were an easy fillet *B* connecting the round and squared portions. In case the shaft is hexagonal and a taper fit in the gear, there is a chance for the same thing to occur, since the gear is not expected to fetch up against the shoulder at the end of the hexagonal portion. *D* is the hexagonal shaft with the fillet used. It is a good idea when a car is overhauled to examine shafts such as these to see whether or not there are signs of twisting. If there are, it will be policy to replace the

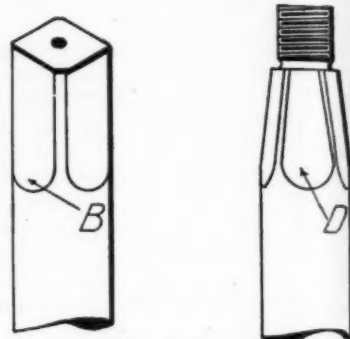


Illustrating Poor Shaft Design.

shafts without waiting for the inevitable fracture to occur. If there is no sign of twisting, it will be extremely easy to help the chance of durability by putting fillets in place of the shoulders. This may be done on an emery wheel if the shoulder is small, or in a shaper or milling machine if the shaft is squared. The illustrations show good and bad forms of squared and hexagonal ends as found on different cars.

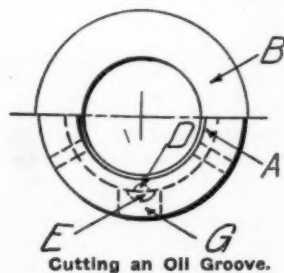
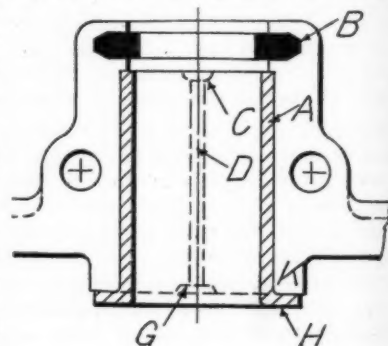
### Value of Oil Grooves.

Two illustrations show a differential sleeve bearing recently under observation. Beyond the end of the bushing *A* was a groove into which a split felt ring *B* was compressed to prevent the escape of oil. At the end of the lower half of the split bushing was a notch *C* about 3-16 by  $\frac{1}{8}$  inch, by way of which it was evidently the intention for oil



How the Ends Should Be Finished.

working to that end of the bearing to return to the gearcase. This excellent idea of the designer had in some manner gone astray, for the return oil groove *D*, which by the way was cut in the under portion of the bushing itself, was hardly more than 1-16 inch wide and 1-32 inch deep, certainly by no means large enough to afford a passage for the thick oil commonly used in gear cases, since capillary action alone would have prevented the oil from flowing, save under pressure much greater than could possibly arise. Worse than that, there was no outlet whatever into the gearcase. The inner end of the bushing was flanged at *H* and neither that flange nor the seat *K* against which it bore was recessed in the slightest. This bearing was considerably cut, and a couple of paper liners had to be put under the lower half of the bushing. In order to give a sufficient passage for the oil, a groove *E* was chipped in the seat under the bushing, and to prevent the paper liners, which now separated the upper and lower grooves, from retarding the flow of oil, they were cut away at the grooves. Since this divided them into separate right and left portions, they were shellacked to the bushing to keep them from shifting, and the bushing itself was secured by brass dowel pins. An outlet was chipped in the seat at *G*. If this treatment had not been applied, the oil reaching the outer portion of the bearing could not have escaped except past the felt washer *B* and it would have accumulated metal particles and started cutting of the shaft and bushing. Small points of construction may make or mar the service that a car will render, and regardless of how well built it may be in general, if attention has not been paid to the apparently insignificant details there will be frequent occasion for repairs.



Cutting an Oil Groove.





Picturing the Franklin Four-cylinder Cars for the Season of 1909.

FRANKLIN cars for 1909 represent the culmination of six years of steady development, beginning in 1902 with a 7-horsepower runabout, which was the first air-cooled car to be placed on the market in this country. It certainly seems a far cry from the crude little machine of that time to the Franklin cars of the present day, but it was with that as a basis that the Franklins of 1909 have been developed, as the original principles which were embodied in this prototype of the air-cooled car in this country are still retained in the 1909 models, many of the features of which differ from those of its early predecessor merely in detailed refinement. Each succeeding year has not only marked improvement in the Franklin cars, but also has seen additions to the Franklin line, the present year being no exception. It now comprises two-seated runabouts equipped with hampers, or with single or double rumble seats, touring cars having a capacity of four, five or seven passengers, and closed cars of all types, such as broughams, landaulets, limousines, town cars and motor cabs.

#### Smallest Franklin Is Now 18 Horsepower.

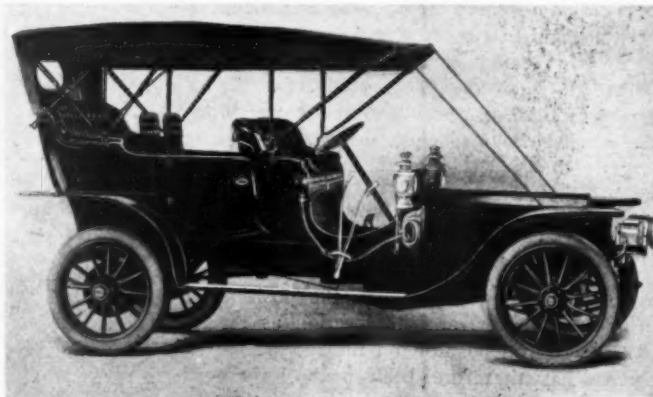
In past years the Franklin company has been turning out a very successful small car with an air-cooled motor rated at 12-horsepower, but for 1909 the smallest car which they will turn out will be known as Model G and will be rated at 18-horsepower. It has a four-cylinder air-cooled motor, the cylinder dimensions of which are  $3\frac{3}{4}$  by 4 inches. It is built on lines similar to the 28 and 42-horsepower motors, except that it is smaller and is a slower-running motor. With its added power and slightly reduced weight, Model G forms an extremely satisfactory four-passenger car, and really places it in a class by itself, when its price, passenger capacity and power are considered in the light of its capabilities.

Among the improvements made in this smallest representative of the Franklin family since the appearance of the 1908 models a year ago, probably the most apparent improvement is the use of 32-inch wheels instead of the 30-inch size formerly employed, this serving to increase the wheelbase by  $1\frac{1}{2}$  inches. Another change of note where the power-plant is concerned is the adoption of a Bosch high-tension magneto as the only means of ignition, in connection with a fixed point of firing. The increase in the wheelbase has also made an extension of the body possible, thus adding to the comfort and appearance of the car. In its fittings and appointments the standard body is somewhat similar to that used last season. But this model is also built

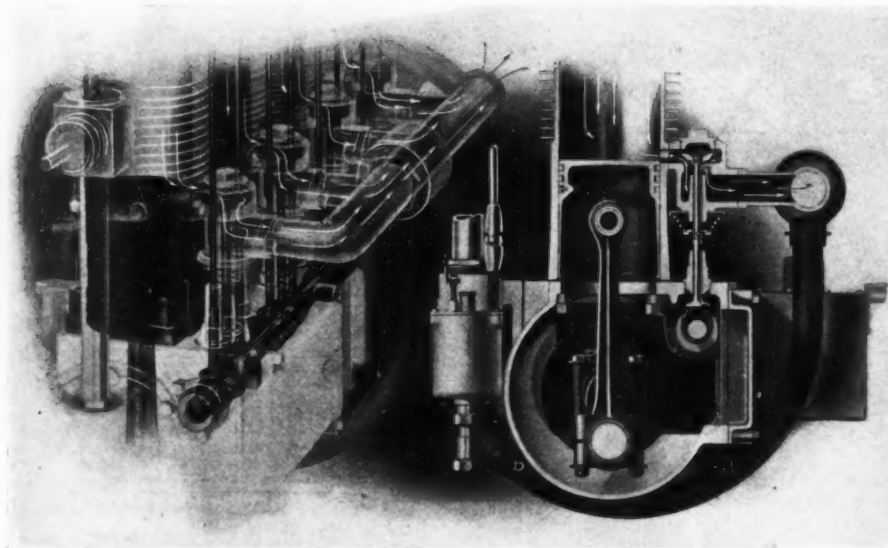
with a brougham body, making it a very serviceable vehicle for a doctor, or wherever a two-passenger closed vehicle is desired. It will also be furnished with a landaulet body similar in design to that used on the 28-horsepower car, but smaller in proportion. These bodies are built by recognized leaders in this line of work and are finely finished. The touring car, landaulet and brougham will be finished in royal blue and the runabouts with a red body and black running gear.

At the other end of the four-cylinder line of Franklins is Type D, a 28-horsepower car, which is the largest four-cylinder car turned out by the Franklin company. Its motor dimensions are  $4\frac{1}{4}$  by 4 inches, and it is also equipped with a Bosch high-tension magneto as the sole source of ignition. As is the case with the smaller cars described, one of the most important changes where Type D is concerned is the adoption of 36-inch wheels instead of the 34-inch size employed during the past season. This gives a much better clearance, makes the car easier riding and adds to the life of the tire equipment, while also giving the car a much better appearance than with the smaller wheels. When built with a landaulet body, however, the 32-inch size wheels are employed, in order to make entrance to the car easier. In touring car and runabout styles this car is equipped with bodies patterned after the lines of the six-cylinder models, except that they are lighter and smaller to conform with the lesser horsepower of the motor.

The six-cylinder model of the Franklin line, which is known



Type H, Franklin Six-cylinder Touring Car.



Views of the Working of the Franklin Auxiliary Exhaust.

as Type H, is built in three different styles. First, as a seven-passenger touring car; second, a single or double rumble seat runabout, and third, as a seven-passenger limousine. This is the highest-powered Franklin car built and is rated at 42-horsepower. One of its features is a steering mechanism of the worm-gear type, which is made by the Franklin company in its own shops. Its design is such as to prevent any lost motion, which is of vital importance, besides being extremely easy to handle. Type H has a 127-inch wheelbase, which admits of a roomy and well-designed body, the extra seats being of the folding or Pullman reversible type, so arranged as to be readily removed, or closed up against the side of the body out of the way. For its power, this is undoubtedly one of the lightest cars on the market, tipping the scales, as it does, at less than 2,500 pounds, though listed at the latter figure.

As in the past, the power equipment of all the Franklin cars consists of four and six-cylinder air-cooled motors. In both design and construction they are similar to the Franklin motors for 1908, except in certain details, which thorough tests in the Franklin laboratories and practise have been found to increase the efficiency of the air-cooled engine. The governor, which has heretofore been considered necessary to the satisfactory working of this type of motor, is not used on any of this year's models, it having been demonstrated that with the present construction better results are obtained without it. This is due, to quite an extent, to the advances made in carbureter design during the past few years, this essential of the motor having been brought to a point where absolute uniformity of action and a perfect mixture under all conditions is assured. On the Model H there has been a slight change in the crankshaft, this being made stiffer and larger, thus adding materially to the smoothness of the engine's running.

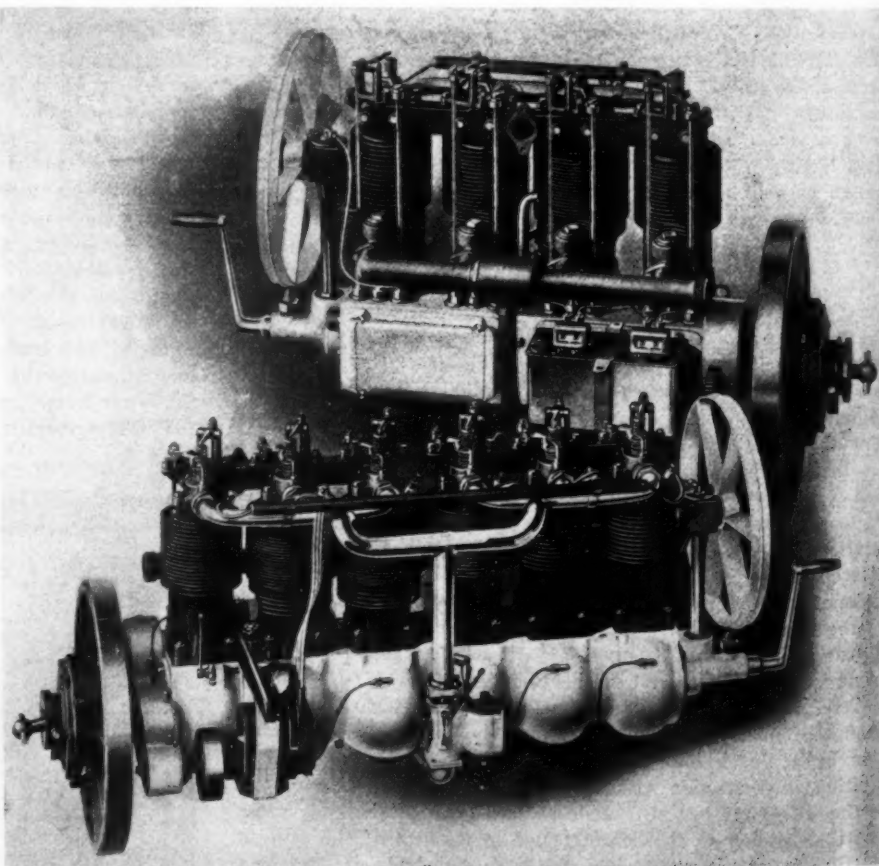
Through extensive hill-climbing tests carried on by the Franklin company it has been demonstrated that the results obtained are more or less affected by the position of the carbureter, and its location as regards a central position on the motor. A change has therefore been made by reversing the position of the carbureter, thus adding materially to the hill-climbing abil-

ity of this year's models. A demonstration of this was the work done by the Franklin cars in the A. A. A. tour, where the uniformity of their power at all times and under varying conditions was noticeable and favorably commented on by the press and contestants, showing the important results obtainable from slight changes.

A change from double or battery and magneto ignition to single high-tension magneto is a very interesting feature of the 1909 models, the Bosch system, which is used, representing the latest practice of the leading French and German manufacturers. On the Model H the magneto's action is controlled by an automatic governor with expanding arms pressing outward against the magneto's balance wheel, thus obviating the possibility of backkick. The method of wiring is also a point worthy of mention, the wires passing through a conduit so constructed as to make the chafing of wire and short circuiting impossible.

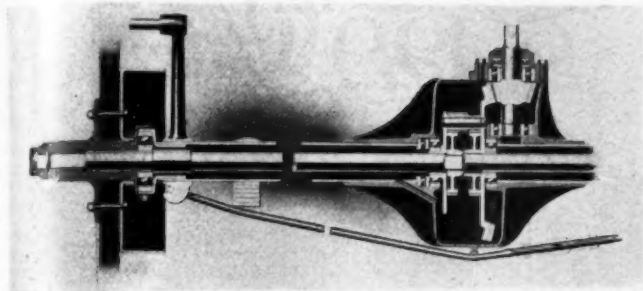
The discarding of the timer has made possible several changes and the elimination of parts which slightly reduces the engine's weight, and naturally simplifies the ignition system, entirely eliminating, as it does, the possibility of timer troubles. This system was used on two of the Franklin cars in the A. A. A. tour and gave such perfect satisfaction as to merit its adoption on all of the 1909 models.

With the new engine construction the front cheek-piece can be removed without disturbing the camshaft, or the camshaft may be taken out without interfering with the cheek-piece. The starting crank in its attachment to the crankshaft has been made waterproof, and is held in place by a leather stirrup. The concentric valve and dome head cylinders are two features used exclusively on the Franklin motors, and while having made their



Camshaft Side of Four-cylinder and Off Side of Six-cylinder Motor.





The Franklin Rear Axle, Differential and Drive.

appearance on the 1908 models, have after a season's use shown themselves so important in the perfect working of the Franklin motor as to entitle them to be incorporated as features of the 1909 models without any changes.

The intake and exhaust valves are concentric, or, in other words, have the same center and take up the same space so far as using the top of the cylinder is concerned. This method of construction makes possible the using of valves having twice the area as where separate intake and exhaust valves are used. This form of valve and the dome-head cylinder fit each other, naturally leaving no corner for dead gases to lurk in, thus making the exhaust more complete, and therefore leaving greater room for a fresh charge. The area of the cylinder's inner surface through its shape is reduced, while the external or heat radiating surface remains the same. Therefore with this construction the cylinders are cooled quicker and more thoroughly than where the smaller valve and flat-top cylinders are used. Other advantages of the concentric valve and the dome-head cylinder are that the opening from the suction pipe to the cylinder is more direct. A greater amount of gas can therefore enter because of the decreased friction in the passage. The suction valve is also kept cooler by its not coming into direct contact with the cylinder head. Therefore, the gas expands less on entering the cylinder and a more concentrated charge can enter. There is less loss of heat in the cylinder, the heat expressing itself more completely in power. It also increases cooling ability by adding to the external surface of the cylinder and decreasing the internal surface. These large and small advantages of the concentric valve and dome-head cylinder are found to be effective at all speeds, but particularly at high speed on hard climbs or whenever the engine is taxed to its utmost.

The method of suspending the Type H engine is somewhat different from that used during the past season, the cross rails being made of angle steel, which also supports the magneto and oiler in a manner greatly reducing vibration and making removal or adjustment easy. A double heat accumulator, which

is the method of securing warm air for the carburetor, is a new feature on the six-cylinder motor. This is accomplished by encircling the auxiliary pipe with a copper jacket and passing the heat so accumulated through the air intake pipe underneath the engine base to the carburetor. The copper case used on this motor is in addition to the regular steel warm-air collector used on all of the other Franklin engines. With the adoption of this device a considerable increase in the carburetor efficiency has been brought about by the perfect mixing of warm air in such volume as may be required by the varying conditions.

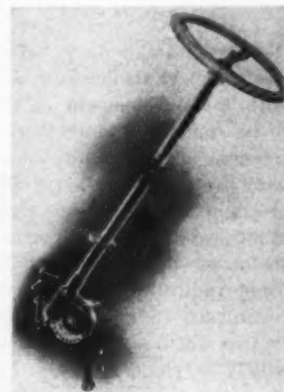
A change in the style of the oiler and method of carrying is such as would seem to add considerably to the convenience of filling the oiler. The Hancock positive gear-driven oiler of various feeds, depending on the size of the engine, is used on all models, being placed directly against the engine base where the oil is, through the warmth expelled from the engine, kept at all times in the proper condition for the most satisfactory lubrication. All the 1909 engines are equipped with a transverse slotted oil baffle plate, used in connection with the splash system of oiling, the pistons in their action forming a suction or natural pump drawing up the oil, and spraying it directly on the points required, causing a more even lubrication than through the ordinary splash system, which distributes the oil without regard to the exact points requiring lubrication and depending upon the operation of the engine for working the oil around.

As has been their policy in the past, the Franklin Company use the lightest yet strongest materials procurable, which by thorough laboratory tests and actual practice have been found to be best adapted to air-cooled motor construction. The valve springs on all models are this year made of vanadium steel, which eliminates almost entirely the possibility of trouble from this source. As a test of these springs the Franklin cars in the A. A. A. tour were so equipped, and covered the entire tour with absolutely no trouble whatsoever. By a change in the position of the carburetor, the connectionless intake pipe has been altered, making a more direct passage for the gases.

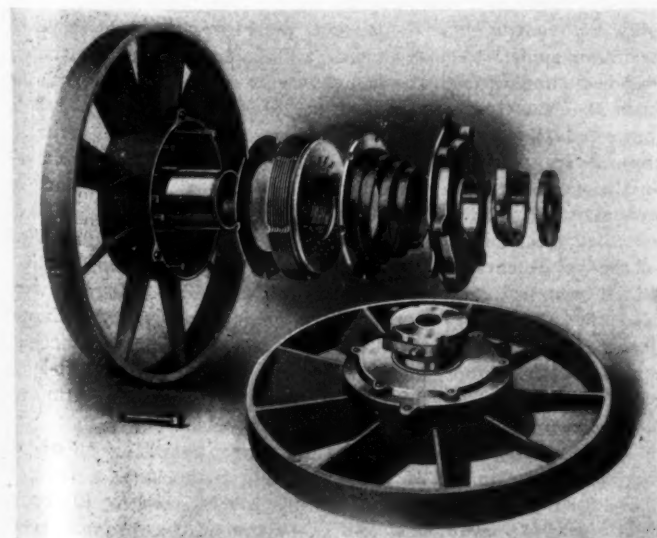
The auxiliary exhaust is an exclusive feature on the Franklin, which, through its unique construction and position, these valves being at the base of the cylinder, dispel 71 per cent. of the burnt gases immediately on the completion of the power stroke, the remaining 29 per cent. passing out through the main exhaust, which, not being connected with the muffler, makes back pressure impossible and thus obviates the necessity of a muffler cut-off. These valves are mechanically operated by the camshaft in a similar manner to the regular exhaust valve.

The clutch is of the Franklin multiple disc type, the discs being made of phosphor bronze and steel alternated. The phosphor bronze discs are prevented from rotating by bolts, but are free to move laterally by friction gradually exerted through a spring. The discs are thus made to revolve, and, pressing out the oil, are brought into action without grabbing.

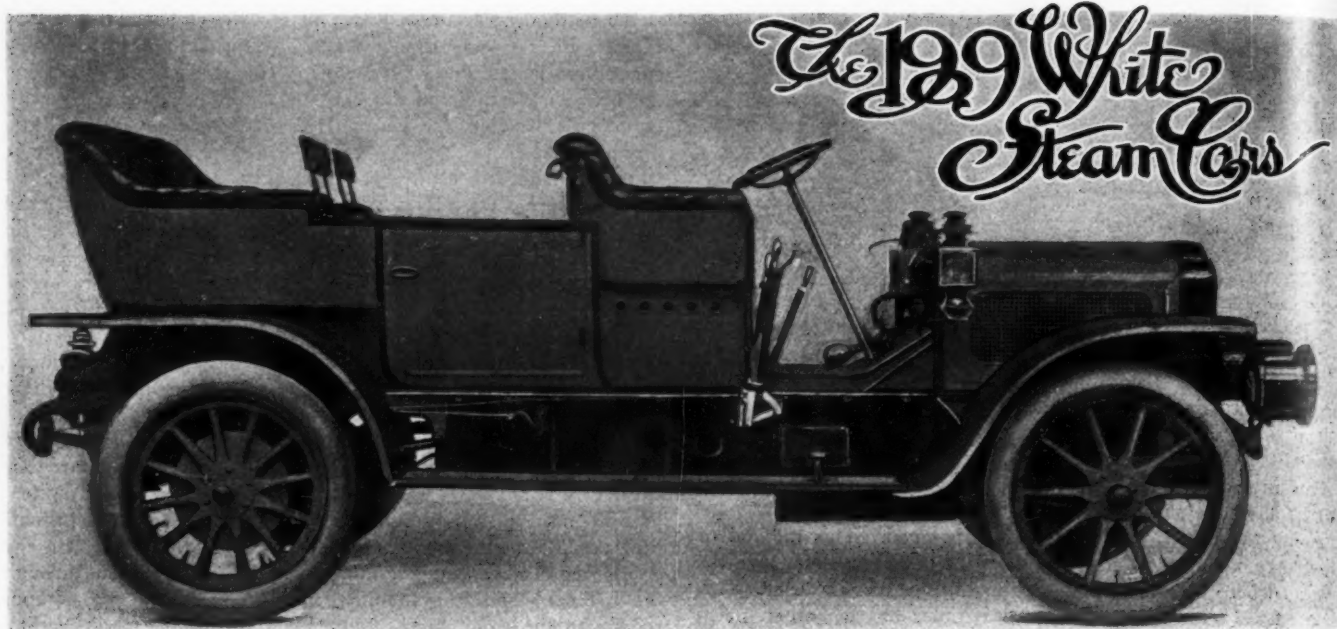
Two styles of change gear lever arrangement are used on the coming season's models, the selective type being used on all models except the 18-horsepower Model G, these being equipped with the self-finding gear shift. The selective type is so constructed as to be entirely free from lost motion, and is positive in its action. Whenever the lever is brought to a vertical position spring tension. The absence of the H-guiding plate used as a rule on the selective type transmission is noticeable. Operation between change gear lever and transmission is direct, all intermediate complications being entirely done away with. Through the arrangement of gears and operating levers it is possible to pass from one gear into another without disengaging the clutch.



Franklin Steering Gear.



Essentials of the Franklin Multiple Disc Clutch.



Model M, the 40-horsepower White Steamer for the Coming Season.

UNUSUAL interest centers each season in the plans of The White Company, because the White Steamer is a distinctively American machine, and the annual announcements dealing with the development of its characteristic features are certain to be something more than echoes of the doings of foreign designers. Furthermore, the announcements of The White Company are of interest, not only to the automobile public, but also to engineers all over the world, because the power plant of the White car is known to them as the most economical and efficient steam power plant ever devised, and the White generator as being radically unlike any other type of steam-making device. As in 1907 and 1908, the White steam car for 1909 will be built in two distinct models, which, while differing from each other widely in power, in size, and in price, resemble each other in their general lines of construction. The horsepower ratings of the two models are based on the actual power delivered at the rear wheels, not the power delivered at the engine.

The larger of the new White cars will be known as the Model M, and will be the successor of the Model K of the present season. The Model M is rated at 40-horsepower and sells for \$4,000, with the usual equipment of acetylene headlights and tank, oil lamps, horn and tool kit. The wheelbase is 122 inches; the front tires, 36 by 4 inches, and the rear tires 36 by 5 inches. The car is regularly fitted with a straight-line seven-passenger body. The engine is compound, of new design, described in full below. The high-pressure cylinder is of 3½-inch bore; the low-pressure cylinder of 6-inch bore, and the stroke is 4½ inches. The frame is of armored wood, the reinforcing plates of nickel steel being fastened on both sides of the wooden sills. The front axle is of a tubular type; the front springs are 44 inches long and 2½ inches wide; the rear springs 55 inches long and

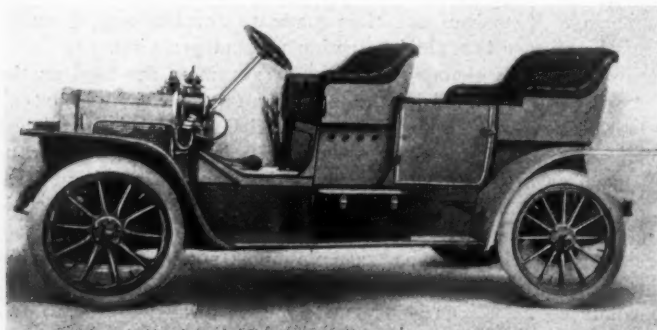
2½ inches wide. Both the foot-brake and the hand-brake act on drums on the rear wheels, the former being of the expanding type and the latter of the contracting type.

The smaller of the new White cars will be known as the Model O. This car may be described more appropriately as a smaller edition of the new Model M, rather than as a successor of any previous model. The Model O is rated at 20 horsepower and sells for \$2,000. The wheelbase is 104 inches and the tires, both front and rear, are 32 by 3½ inches. The car is regularly fitted with a straight-line five-passenger body. The engine, except as regards size, is identical with that in the Model M. The high-pressure cylinder is of 2½-inch bore, the low-pressure cylinder is 4¼-inch bore; the stroke is 3 inches. The frame is of heat-treated pressed steel. The front axle is a one-piece forging of I-beam cross-section. The front springs are 37 inches long and 1¾ inches wide; the rear springs are 45 inches long and 1¾ inches wide. Both the foot-brake and the hand-brake act on drums on the rear wheels, the same as on the Model M. As in the larger car, the water tank is placed under the foot-boards and the fuel tank is in the rear.

#### The White Engine Improvements.

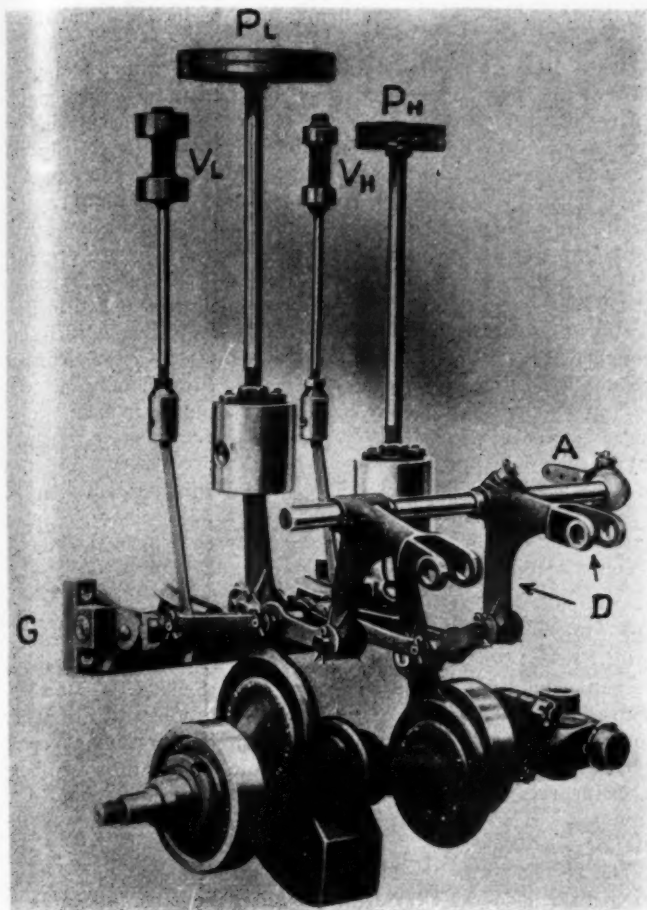
The principal mechanical change in the new cars, as compared with previous White models, is in the engine. As previously mentioned, the engines in the two new models differ only as regards dimensions, and, therefore, the following description applies to both models. The new engine construction has been undergoing a thorough trying-out for two years, and both the Model M engine and the Model O engine have been subjected to tests of over 30,000 miles of usage, and, therefore, may be regarded as thoroughly seasoned products. The change in the engine may be summarized as follows: In the place of one standard type of valve mechanism another standard type of valve mechanism is used. In former years the engines used in the White cars were fitted with the Stephenson link motion, which was actuated by eccentrics on the crankshaft, as were also the pumps. The new White engines are fitted with the Joy direct valve action, which is operated from the connecting rods; and the pumps, all of which are located on the left-hand side of the engine, are driven directly from rocker arms, attached to the levers of the valve-operating mechanism.

This new construction permits of a great simplification of the engine. The number of parts is reduced almost to a half of those formerly necessary, considerable weight is saved, all eccentrics are done away with and the cylinders are brought close together, permitting the use of a short one-piece crankshaft.



Model O is a 20-horsepower Replica of the Larger White.





Complete Working Parts of White Compound Engine.

PH, high-pressure piston; PL, low-pressure piston; VH, high-pressure valve; VL, low-pressure valve; G, valve guide, by tilting which the engine is reversed; A, rocker-arm which drives the oiler; D, rocker-arms which drive the pumps.

The new crankshaft is a one-piece forging of tool steel, and, as shown in Fig. 2, there are but two mainbearings to the crankshaft. This is a most advantageous construction, because when three or more bearings are used in any shaft there is always a possibility that they may get out of alignment. The main bearings are of the annular type and may be removed from the crankshaft by taking off the lock nuts and lock washers, as shown in Fig. 2. The two main bearings and the two connecting rod bearings are fitted with ball separators, and the balls are of extra large size. The connecting rods are one-piece forgings.

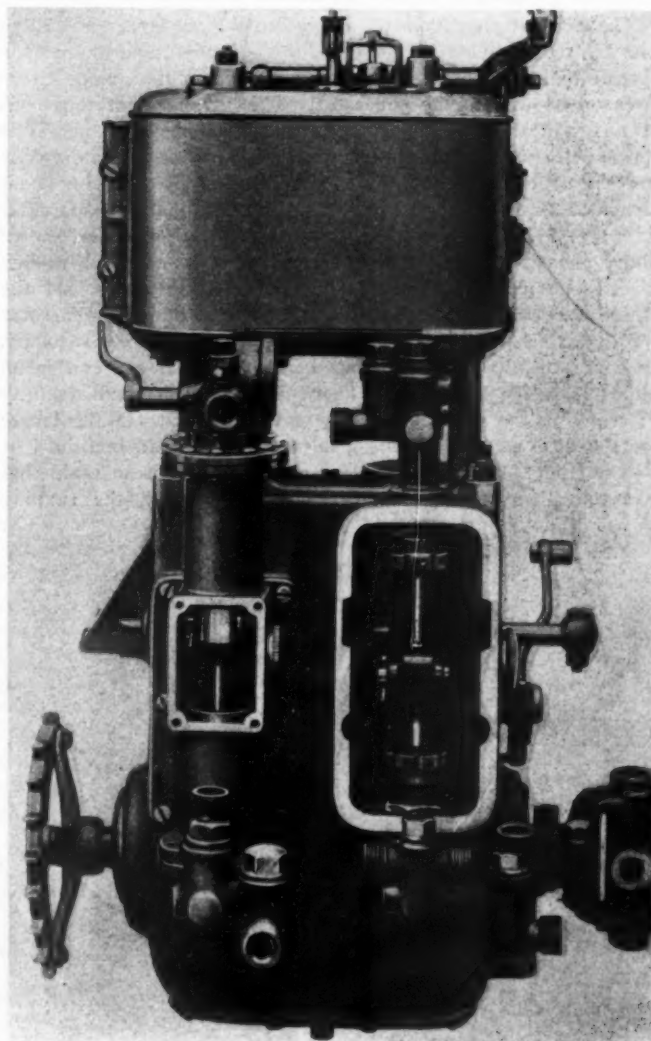
In Fig. 3 are shown all the working parts of the new White engine, the pistons, crossheads, connecting rods, crank, valve mechanism and pump levers. It will be seen that both the high-pressure valve and the low-pressure valve are piston valves. Steam is admitted through the center of the valve and exhausts at the ends. The pressure on the valve stuffing-boxes is thus reduced to that of the exhaust from the respective cylinders. The small arm, A, on the end of the pump rockershaft is connected by means of a rod to a ratchet device which drives the oiler placed on the dashboard. The sprocket on the forward end of the crankshaft is connected by chain to the fanshaft, and the ratio of the sprockets is such that the latter runs faster than the engine. The fan itself is not rigidly fastened to the shaft, but is connected by an ingenious ratchet device which permits the fan to run ahead of the shaft. Therefore, when the engine is stopped or slowed down the fan continues to run as long as its momentum persists, thus preventing any back-lash in the chain. The fanshaft housing is held in place by eccentrics and the tension of the chain may be readily altered by turning these eccentrics. As a good draft of air between

the condenser tubes is an important element in securing good condensation, which means good economy in water consumption, these improvements in driving the fan are of no little importance in the running of the White cars.

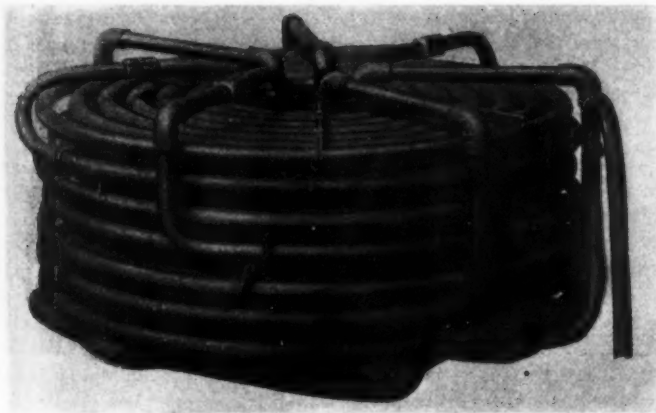
#### Accessibility Is a Prominent Feature.

The crankcase of the engine is made in one piece, but ready access may be had to all the parts within by the removal of the side and bottom plates, and the crankshaft may be taken out through either end. The new engine permits of a pleasing and symmetrical arrangement of the necessary piping, and everything under the bonnet is easily accessible. Stuffing-boxes are fitted to the upper end of the slides in which the crossheads travel, so that no oil may be splattered out of the crankcase. There are the most thorough provisions for keeping everything within the crankcase well lubricated. The cylinders are provided with relief valves for getting rid of any water which may be in the cylinders when starting the engine "cold." These valves are opened momentarily by a small lever on the dash, before admitting steam to the engine, and the entering steam quickly and effectually removes the water.

The engine is so adjusted that it runs normally on the "cut-off," that is, the admission of the steam to each cylinder is stopped before the end of the stroke and the steam then works expansively for the balance of the stroke. In starting the engine, the pushing of the "simpling" pedal allows the engine to take steam during the full stroke. There is also a "cut-off" pedal which, when passed, produces the same results. This "cut-off" pedal is used only when slow, hard pulling is required, as in climbing particularly steep grades or running over very



The White Engine Ready to Place on the Chassis.

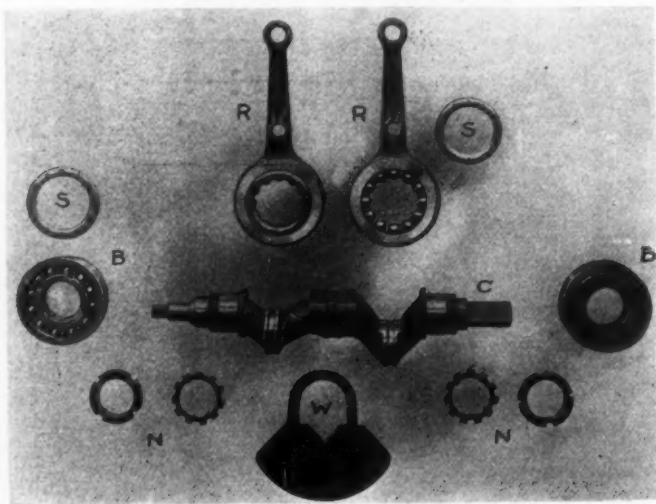


Steam Generator of the White Cars.

heavy roads. An interesting feature of the Joy valve mechanism is that, when the "cut-off" is changed, the "lead" of the valves is unchanged and the engine thus runs more smoothly on "cut-off" than was possible with the Stephenson valves. The engine is reversed and the "cut-off" is changed by simply changing the tilt of the guide, *G*, as shown. The engine is supported on two cross-members of the frame, which are so placed that the entire weight of the engine is behind the front axle. The engine is so hung that the driving shaft is perfectly horizontal, and, as there is neither clutch nor transmission gear on the White, the drive is direct and positive from the engine through the driving shaft to the rear axle.

#### Unique System of Steam Generation.

The exhaust pipe from the engine to the condenser is located on the right-hand side. Within this exhaust pipe there is a coil of piping, through which the water from the pumps circulates on its way to the generator. This arrangement thus constitutes a neat and compact feed-water heater, which performs the double function of heating the feed-water and of aiding the process of condensation. The generator is of the same construction as in former years. For those who are not familiar with this device, it may be said that the White generator, shown above, consists simply of a series of coils of steel tubing, placed one above the other, and connected in series. If the whole were to be unwound and straightened out, the generator would be seen to be made of a single long piece of tubing. In operation, the water is pumped into the upper coil and steam issues from the lower coil. There is but a very small quantity of water in the generator at any given moment (in the larger car the total capacity of the generator is less than one-third of a cubic foot), but the process of making steam is so rapid that steam is always available in the quantity which the running



Crankshaft, Connecting Rods and other Essentials.

conditions may make necessary. In both the Model M and Model O cars the generator tubing is of  $\frac{1}{2}$ -inch internal diameter, but the length of tubing used differs, of course.

The system of regulation, whereby the temperature and pressure of the steam are kept constant without in any way engaging or requiring the attention of the operator, is the same in the new models as in the 1908 machines. To describe briefly the scheme of regulation, the supply of water to the generator and the supply of fuel to the burner are so controlled as always to be in perfect balance with each other. As soon as the steam pressure rises appreciably above the normal working pressure both supplies are at once cut off. As soon as the pressure drops at all below the normal both water and fuel are supplied in proportionate quantities. The devices which regulate the fuel supply and the water supply are positive in their action, contain no delicate parts, and depend for their operation only on temperature and pressure, forces which are absolute in their working. External atmospheric or climatic conditions in no way influence the action of the regulating devices. In conclusion, it may be stated that those who know the White car will have no difficulty in recognizing the new models at a glance, as they exhibit the characteristic external features which distinguish the cars of this make—now entering upon their ninth year.

#### A NEW METHOD OF AUTOGENOUS WELDING.

Of unusual interest to the automobile trade is the new method of autogenous welding developed by A. K. Schaap, 344 Cumberland street, Brooklyn, N. Y., and recently demonstrated in public for the first time. The improved form of blowpipe invented by Mr. Schaap makes it possible to obtain temperatures of about 4,500 degrees, using only an air blast and a small amount of city gas. Even higher temperatures may be obtained by the use of acetylene.

The peculiarity of the blowpipe is that it employs two streams of air, one under a very light pressure, the other under about 30 pounds; these mingle with the gas, and it is claimed that the nitrogen of the air is thrown to the outside of the flame, leaving almost pure oxygen in the core. In this way results can be obtained almost equal to those from blowpipes using chemically pure oxygen in tanks, without the expense. Iron, brass, and even aluminum can be welded by this process.

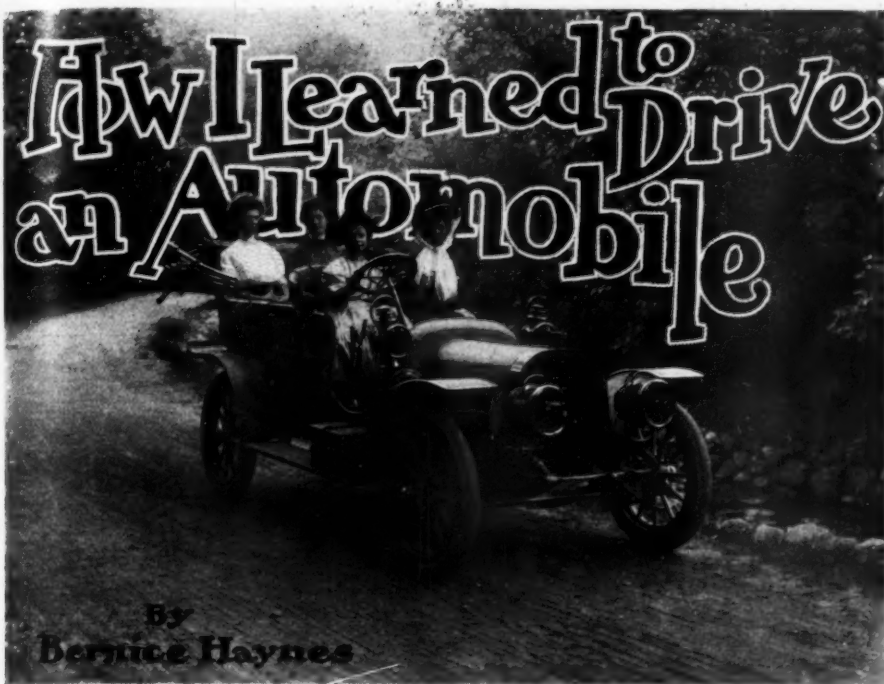
An automobile rear axle was exhibited, in which the aluminum flange forming the side of the differential casing had been broken off and welded back in place, making the piece apparently as good as new.

#### TASMANIA OFFERS A MARKET FOR AUTOS.

The tariff on automobiles imported into the Commonwealth of Australia has been materially reduced, and according to reports from Consul Henry D. Baker, of Hobart, Tasmania, a considerable field for American manufacturers has been opened up in that island. The duty formerly was 20 per cent. ad valorem, but the new tariff has changed this to 35 per cent. on the body and 5 per cent. on the chassis, which makes a reduction on the whole car of, roughly, one-half. Tasmania is a country of wonderful scenery and roads exceptionally good for this part of the world. About 25,000 tourists from the mainland of Australia visited the island during the last season and many of them brought their cars with them. Automobilists here favor low-powered cars of between 10 and 18 horsepower, preferably with four-cylinder engines. Most of those in use are of French or English make; unfortunately there is a prejudice against American cars, owing to the fact that the first ones imported were cheap runabouts which met with poor success on the hilly roads of the island and were difficult to repair.

Nevertheless a good market could easily be made there for American automobiles if the manufacturers were willing to establish direct agencies in Hobart or even in Melbourne. Cars should have metric sizes of rims and spark plugs.





Miss Bernice Haynes at the Wheel—Mrs. Elwood Haynes Alongside.

FATHER has owned an automobile, or "engine buggy," as I called it, ever since I can remember. He built the first one before I was two years old, and I have ridden in them whenever I wanted to do so since then. I have never driven the first automobile father made, because I was too small when we used it. It had been standing in the factory until the Spring automobile parade in New York, in which father drove it.

I have always wanted to learn to drive an automobile. When I was eight years old I guided a two-cylinder runabout four miles into the country and father drove it back. That satisfied me for the rest of that Summer, but the next year I wanted to go farther, or to go alone. Father finally gave me permission to drive around the block alone. I did this a great many times, always going on the slowest speed. I usually took two or three of the neighbor's children with me. Some of the neighbors would not let their children go with me, but they might as well have consented, as we did not have any accidents.

One evening I wanted to drive a car around the block. The automobile, a two-cylinder runabout, was standing in the driveway, and father said that I might take it if I would back it out into the street. I started the engine—this was about the first time I had ever done that—and I backed the automobile out of the yard. My grandmother was an observer, and she said that I would certainly be killed if I started out at that age to drive an automobile.

One evening, just about dark, we were out riding and ran out of gasoline about three-quarters of a mile from home. We were not far from the trolley line, so father went to the factory on a street car and brought a can of gasoline from the factory in another automobile. We did not know what to do with two automobiles. I suggested that I could take one of them home. Father and mother discussed this plan for a short time and finally agreed to allow me to drive the one home in which we had been riding. Father, mother, and my brother took the other car and drove home on the slow speed. I kept very close to them all of the way, and we accomplished the run without an accident. I thought that after I had done as wonderful a thing as to drive an automobile for three-quarters of a mile without any accidents, I certainly should be allowed to do it again, but father said that I must not, because if the engine stopped I could not start it again.

About a year after this, when I was eleven years old, father had to go away. He took a car to the station, which is about a mile and a half from the factory. As there was no one else

at the station who could take the automobile to the factory, father let me take it. This was the first time I drove alone on the middle speed.

I was not allowed to drive alone very frequently until last Autumn. Mother suggested that we might take a ride on some nice day and father said that I might take mother for a ride whenever she wanted to go.

The second drive I took with mother last Autumn we decided that we wanted to gather some walnuts. Father said that we must not go directly to the walnut grove, as there was a bad hill to descend on the way. We went about a mile farther than the grove, and drove back to it on another road, thus avoiding the bad hill. I had to let the engine run all of the time we were gathering walnuts, as we could not start it again. On the way back we went up the bad hill.

One afternoon this Spring I was driving in the country and noticed that the engine was working badly. It finally stopped. I thought that the battery must be out, so I looked under the rear seat and found another battery. We examined

the one that was connected and connected the other one the same way. It worked well after that.

We have taken a great many other drives of from 20 to 30 miles in length. I usually go between 18 and 20 miles an hour.

Two kinds of gears are used on automobiles—the clutch gear and the sliding gear. The clutch gear is operated by a lever which releases the clutch when removed from a notch and engages it when placed in a notch. In this way there is no possibility of having two sets of gears in operation at the same time. The sliding gear is used on most four-cylinder cars. It has a short revolving shaft fastened to the engine. On the end of this shaft is a cogwheel which communicates the power to another shaft by a larger wheel. The power is then transferred to the driving shaft by a small wheel on the former to a large wheel on the latter when slow speed is desired. The intermediate speed is secured by bringing two wheels of about the same size into contact. The high gear is in use when the driving shaft is locked to the engine shaft.

When operating a sliding gear, the clutch is released with the foot, and the lever is placed in the position for the desired speed. The clutch should be let in gradually or the gears will become damaged. It is usually best to start on the slow gear, or the engine may be stopped. With some practice and a high-powered engine, it is possible to start easily on the high gear. When a lower speed is desired the engine should be allowed to run at a speed corresponding to the desired speed of the car. The "Haynes," the only car I have ever driven, is equipped with a patented device, so that a lower speed may be thrown in at will and will take hold when the car has slowed down enough.

The spark should usually be placed below center after the engine is started. It must always be quite a distance above center when the engine is started, or it will explode too soon, and it may result in injury to the operator.

The throttle should be opened when starting the car. It is usually best to drive as much as possible on the high gear and regulate the speed of the car with the throttle.

It is always advisable to turn all corners slowly, and to drive slowly on any wet place where the car would be likely to skid.

Small machines are often steered with levers. This is a very good way for small cars, but it is not best for the large cars, as the lever communicates all jolts of the wheel to the hands. Wheels are used on large cars and they are much more serviceable than levers.

When meeting a team on the road, it is best to go slowly, but

not to stop unless the occupants of the vehicle demand it. One should turn out well to the right, far enough in front of the team so that the driver of the carriage may have plenty of time to get on the opposite side of the road and thus avoid any confusion. When passing a team from the rear, it is advisable after giving the occupants of the carriage a warning, to pass the vehicle slowly. With a high-powered machine this may be done with the high gear with very little noise. If the gear has to be changed, it should be done before reaching the horse, as the noise made by changing gears might frighten the animal.

When driving on crowded streets it is best to drive on the slow speed and be ready to stop instantly. A warning should be sounded at every corner.

### ALL KINDS OF FUEL WILL BE USED.

PARIS, Aug. 20.—The use of all kinds of fuel, economy in its use, and regularity of running will form the basis of the taxicab and light industrial vehicle contest to be held in and around Paris from October 1 to 10. On the first day out all competitors must run on gasoline; on the second and third days 50 per cent. carbuated alcohol is obligatory; during the fourth and fifth days Lepretre's "White Spirit" must be used, and on the last three days the choice of fuel is left to the competitors. Fuel consumption will be the base of the classification, the calculations being made on a price basis.

Two main classes are provided for in the competition, each one of which is divided into three or four sub-classes. Thus, in the taxicab competition, the first class is for six-passenger hotel omnibuses with baggage capacity; the second for four-seated taxicabs, and the third for the smallest two-passenger cabs carrying no baggage. In the delivery vehicle class there are four divisions, for motorcycles with carrier attached; vans with a load capacity of 440 pounds; larger vehicles carrying up to 1,300 pounds; and, finally, for covered vehicles capable of taking a load between 1,300 and 2,640 pounds.

During the seven days' running, most of which will be around Paris, a schedule varying from 5 to 18 miles an hour must be adhered to, with numerous controls, no speeding between controls to make up for lost time being allowed. Failure to make a control on time entails disqualification. There will be a hill climbing competition during the test, and a speed test with standing start over a distance of 300 meters. These, however, do not figure for the classification, which is made entirely on the

T C

following formula,  $\frac{T}{P \times D}$ , in which T is the number of hours' running; C the fuel consumption in francs; P the useful load in kilograms, and D the number of kilometers covered.

All vehicles will be placed in a closed park at the end of each day's run, one hour being allowed for oiling, filling tanks and cleaning. No repairs or adjustments must be undertaken, officers being appointed to see that this rule is observed. Whatever repairs are necessary must be done by the team on the cars and by the tools and parts they carry with them, outside help of any nature whatever being rigorously refused.

### PROSPECTS FOR AUTO TRADE IN ALGERIA.

American automobile manufacturers who wish to increase their export trade would do well to consider Algeria, according to reports from Consul James Johnston, of Algiers. Automobiles are already used by wine and oil merchants who have to travel in districts as yet inaccessible by railway. The indications are that a permanent and profitable market could be created here by an American manufacturer willing to go to the expense of properly introducing his cars. A direct agency should be established, with literature in French, and demonstrating cars on the floor. No sales can be expected through catalogues alone. The duty on automobiles imported from the United States is 60 francs per 100 kilos (\$5.27 per 100 pounds) on cars weighing over 125 kilos.



One of the Brush Cars Used by Washington Post-Office.

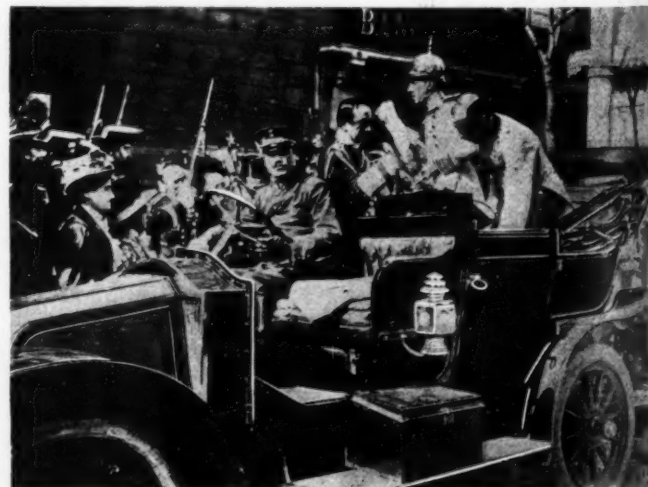
### WASHINGTON POST-OFFICE TO USE AUTOS.

WASHINGTON, D. C., Aug. 22.—The Brush-Nichols Company, agents for the Brush, have entered into a year's contract with the postal authorities of this city for furnishing four Brush package wagons to be used in collecting mail in the outlying sections of the city, as well as in the business centers. The company has opened a garage in the rear of the city post-office, where the cars will be kept. The contract calls for the furnishing of the cars, together with competent operators, and it has been decided to work two shifts of men in driving them, the vehicles being in service from early morning until after midnight each day. Three cars will be used in the service regularly, while a fourth will be held in reserve.

The Brush cars have since been supplemented by two single-cylinder Cadillacs, provided and operated by the letter carriers under an allowance secured from the Post-Office Department.

It has been announced that the six cars in operation save the service of eight men and twelve horses.

This contract is remarkable in that the Post-Office does not buy the cars outright, but only rents them; the cars are taken care of and the drivers furnished by the agency. All parties concerned are benefited by this arrangement, which is in line with the modern tendency toward specialization. It will undoubtedly be found most advantageous in all cases where a company needs but few cars and cannot afford to maintain a garage department to care for them. The success in operation of the Washington equipment will be closely watched, and its economy over horses will doubtless lead to the adoption of a similar service in many other large cities where the use of horses and wagons is now responsible for much delay.



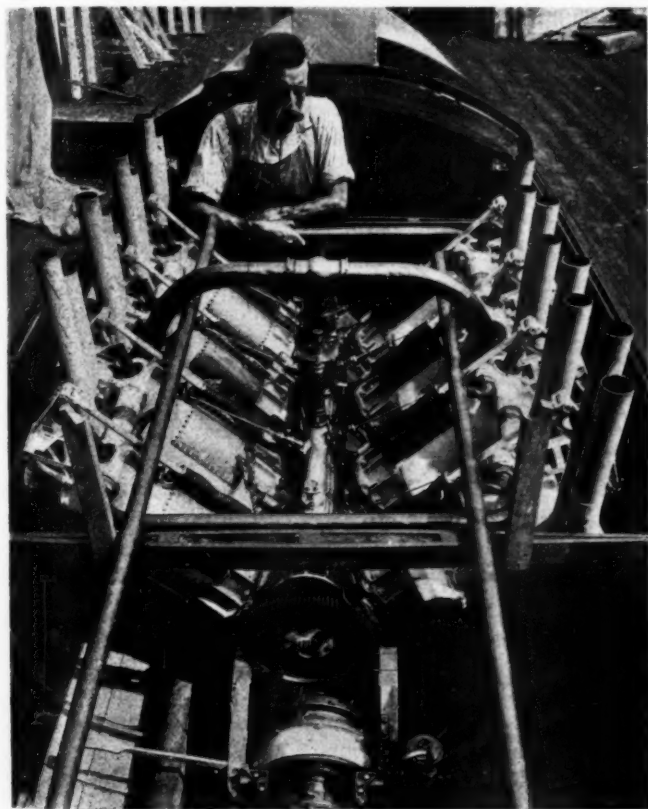
The King of Spain in Renault Which He Constantly Uses.



## EIGHT-CYLINDER ENGINE OF THE DIXIE II.

IN view of the remarkable performance of the *Dixie II* in defeating boats of nearly double the power in the race for the Harmsworth trophy, and her later feat of covering a 30-mile course at the Thousand Islands in 58 minutes, thereby winning the final contest for the Gold Challenge Cup, some particulars of her engine are naturally of interest.

Speaking in general terms, the engine is of the Antoinette type, carrying 8 cylinders arranged in two sets at an angle of 90 degrees from each other, with pistons working in pairs on a four-throw crankshaft of general form, similar to that used in four-cylinder engines. This type of engine was chosen for the saving in weight of crankshaft and crankcase which it permits. In details, however, the engine differs considerably from that of its famous prototype. The engines against which it competed were of the ordinary automobile type, but the engine of the *Dixie II* may fairly be said, for the large cylinder dimensions and the special purpose for which it was designed, to mark an advance over the automobile type. The cylinders are



Engine of Dixie II, Winner of Harmsworth Trophy.

7 1/4-inch bore and stroke, the extremely short stroke common in automobile construction being avoided because it would mean an undesirable increase in the revolutions per minute. Automobile engines of this size have been found to give considerable difficulty in the matter of keeping the valves and piston heads cool, and this fact has necessitated using lower compressions than are customary in smaller sizes, with a resulting sacrifice in power. To a large extent this over-heating is avoided in the engine of the *Dixie II* by the use of auxiliary exhaust ports uncovered by the pistons. A special set of cams operates poppet valves controlling these ports.

The cylinders are cast separately, and the inlet and main exhaust valves open directly into the heads. The water jackets are cast in skeleton only, and are closed in by brass plates screwed over gaskets. A single camshaft operates all the

valves. The cams are under cut, and the inlet valves are pulled open against their own spring tension by strong springs, so that one cam operates both valves of each cylinder. A separate shaft carries the cams for make and break ignition.

The crankcase is a manganese bronze casting, and the oil pan, as usual, is aluminum. The pistons, wrist pins and connecting rods are of quite extraordinary lightness, and the last named are hand forged of alloy steel. To secure adequate bearing surfaces at the crank end of the connecting rods without unduly elongating the shaft was a difficult problem, whose solution was found in the novel expedient of giving one connecting rod of each pair a bearing over the entire crankpin, and so forming the outside of the big end of that rod as to afford a bearing for the other rod. In other words, one rod works on the pin and the other rod works on the big end of the first rod. Naturally this implied a special design for four of the rods, but the two sets of rods are nevertheless alike in weight.

Lubrication is effected by a pump which takes oil from a well at the after end of the crankcase and forces it through a filter from which the main bearings and the pistons are supplied. Splash is not depended on, and in fact the cranks do not dip into the oil. Each of the main bearing bushings has a central annular groove to which oil is fed, and this groove registers with a hole drilled in the shaft. The shaft and cranks are bored hollow and of rather large diameter, and the ends of the holes are closed, thus forming oil chambers which, under normal conditions, are constantly filled with oil from the main bearings. Passages drilled in the cranks carry the oil to the crank pins, and from these it escapes to the crank pin bearings. As an illustration of the extreme refinement necessary to keep the engine within the required limit of weight, it may be remarked that the crank pin bearings are lined with white metal only 1/32 of an inch thick, these linings being cast in the rods and bored to size.

Reversal is affected by planetary gearing carried in a frame bolted to the after end of the crankcase. A friction clutch starts the propeller in the forward direction, and positive dogs take the load when the clutch has nearly ceased to slip. The cylinders are cooled by eight separate plunger pumps, which deliver water through separate pipes so that each cylinder is sure of getting its share.

The flywheel is a manganese bronze casting, bolted and keyed to a large flange at the forward end of the crankshaft. The carbureter is of Crane & Whitman design. It has no auxiliary air valve, this being considered undesirable for racing purposes.

The engine weighs complete about 2,200 pounds, including reversing gears and pumps. It is capable of developing approximately one horsepower for each ten pounds weight, and its maximum speed is somewhere between 850 and 900 r.p.m.

### PARIS-TO-THE-SEA HAS SMALL ENTRY.

PARIS, Aug. 20.—Paris-to-the-Sea, the annual cruise and race which the capital has put on foot for a number of years, with varying success, is this year almost entirely an outing of amateur motorboat men, the trade element being conspicuously absent. When the start took place at Maisons-Laffitte, the Parisian suburb, the fleet did not number a dozen, and among them was not a single really fast boat. *Delahaye-Nautilus*, one of the Monaco champions, gave a demonstration of speed and was followed by the *Fauber*, the curious hydroplane built and owned by W. H. Fauber, formerly of Chicago, but neither boat went with the fleet, and it is doubtful if they will go later to Havre and Trouville for the races.

The cruise, which lasts eight days, will take the boats down the River Seine by easy stages until Havre is reached, when racing commences.

# THE AUTOMOBILE

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## THE LIGHT CAR COMING INTO ITS OWN.

In histories of the automobile industry written from the viewpoint of future decades, the year 1908 will undoubtedly stand forth as one of the most noteworthy periods of transition. Not that there have been any important inventions or revolutionizing discoveries, which were formerly so freely predicted—far from it. The science of automobile design, as far as its fundamental principles are concerned, is as fixed and definite as any other branch of engineering. But now, for the first time, we have realized and made full use of the immense progress in refinement and detail.

Hitherto the large car has been the one and highest ambition of every automobile manufacturer; no one seemed to regard himself as firmly established in the industry until he could exhibit a model of from 40 to 60 horsepower. The oldest makers, it is true, worked their way up more or less gradually from the small car; later comers built small cars for one year, at most, and then jumped into the large car class.

Some critics have called this movement a mere craze for speed and power. But that is hardly just; these men saw the boundless possibilities of the automobile, and were striving to realize them in the easiest and most obvious way. They wished to build a car which could go anywhere—climb mountains, plow through mud hub-deep,

cross trackless deserts—and they succeeded. Their cars have strength, power, and reliability, but they are too expensive, except for buyers who want cars *de luxe*.

But what was a problem solved itself, as problems often do. While engaged with other and apparently more important questions in large car construction, designers had gradually been improving the efficiency. Every year the same cylinder bore, the same gallon of gasoline, has been made capable of doing us more work. Now, all at once, they have realized that they can build a car of twenty horsepower with all the ability of the earlier forties and sixties. Thus, in the development of the once scorned and neglected light car, has appeared the true solution.

Manufacturers and buyers alike are now beginning to understand that high power, in itself, so far from being an advantage, is in reality a drawback. It is costly, wasteful, and dangerous in the hands of inexperienced or reckless persons. Only the ability which it confers is desirable, and now we can obtain the same ability with half the power and half the expense. Four cylinders of say four inches bore, will carry five persons everywhere they wish to go, quickly, surely, and comfortably, with a bill for gasoline, oil, and tires that is astonishingly low.

These light cars are not merely reduced-size copies of larger models. Their designers have taken full advantage of every improvement in large car construction, and have seized upon several ideas, such as block-cylinder casting and unit construction, which, though of uncertain origin, seemed peculiarly adapted to their ends; but they have also shown remarkable ingenuity and resource in many less noticeable places. Add to this a factory organization and equipment scarcely thought possible a few years ago, and the modern light car appears. Next season it will assume its proper position as a most important class.



## WHAT THE LONG ISLAND PARKWAY MEANS.

The building of the Long Island Motor Parkway is of great significance to the American automobile industry. In its influence, rather than in the results accruing from its direct use, will be found a large part of its value, for if a special highway for automobiles can be built and maintained in one part of the country, there is no reason why similar enterprises cannot be set afoot wherever the population is such as to warrant it, and there are not a few parts of the United States where the automobiling fraternity is sufficiently numerous and progressive to support such an undertaking.

Not the least part of its value will be found in the demonstration that it will afford of the fact that the dustless highway is a practical possibility of the near future, and its influence in this respect should not only prove of value to others backing similar enterprises, but to the course of highway improvement in this country as a whole, for the dustless road is as much of a necessity to horse traffic as it is to the automobile. Since there will be no horse-drawn vehicles on this parkway, it will be possible to see just what effect the surface of the specially constructed highway will have upon tires and also what effect tires will have upon the road. Considered in whatever light it may be taken, the parkway is bound to be productive of valuable and lasting results. Its construction shows that, the automobile having developed to a high standard, the creation of highways on a par with it is in order.



### A. A. A. GRANTS A NUMBER OF SANCTIONS.

NEW YORK, Aug. 25.—At a meeting of the Sanction Committee of the Racing Board of the American Automobile Association, held at the national headquarters, 471 Fifth avenue, to-day, applications for sanctions for various events to be held in the near future were granted to six different organizations affiliated with the A. A. A., the applicants having complied in every way with the rules of the Racing Board. The sanctions granted were as follows:

Automobile Club of Minneapolis, hill-climb; Automobile Club of Minneapolis and Automobile Club of St. Paul, joint auspices, race meet; San Antonio (Tex.) Automobile Club, 12-hour endurance contest; Wildwood (N. J.) Motor Club, speed trials; Sonoma County Automobile Club (Santo Rosa, Cal.), race meet; Richmond (Va.) Automobile Club, race meet.

Reservation dates were also requested for sanctioned events to be held in the near future at Poughkeepsie, N. Y., Hot Springs, Ark., and Washington, D. C.

### TWO MORE VANDERBILT CUP ENTRIES.

It was stated from an authoritative source on Wednesday that an entry of a Thomas car for the Vanderbilt race, to be held over the Long Island Motor Parkway, October 24 next, had been mailed direct from the offices of the E. R. Thomas Motor Company, in Buffalo, to Jefferson De Mont Thompson, chairman of the Vanderbilt Cup Commission.

In addition to this entry, word comes from Trenton that the Roebling car, now under construction there by W. A. Roebling, would also be entered. This is a four-cylinder machine, the motor of which has developed 140 horsepower under tests. It is expected to be ready for the road by September 15. An entry of a Knox car is also looked for. The first entries close Tuesday next, September 1, on which date W. K. Vanderbilt, Jr., is expected to return from abroad.

### AUTOMOBILE NEWS MADE IN GERMANY.

BERLIN, Aug. 20.—There is much indignation in Germany at the trick played by the Italians on the trade and press of the rest of Europe. Reports from Turin declared that the victorious Mercedes Grand Prix team had been entered for the Bologna meet, and on hearing this several other big firms sent in entries, only to find that the whole thing was a hoax.

It will be remembered that Belgium gave up its Ardennes race this season in order not to conflict with the Bologna meet, and was to receive the benefit of a reciprocity action on the part of the Italian A. C. next year, when Belgium was to be the only country to hold a big event after the Grand Prix.

### PRESIDENT RECEIVES THE THOMAS CREW

The Thomas car which won the New York to Paris race is en route to Buffalo on a demonstration trip, in charge of George Schuster and George Miller, its victorious crew. Joseph Tracy is accompanying the outfit and will make a report of the conditions and running of the car on the trip.

Last Friday the car, its crew, and Harry S. Houpt, its entrant, were received by President Roosevelt at Oyster Bay. The President was much interested in the story of the trip and congratulated its crew on their victory, declaring that it added another leaf to the laurels America won at the Olympic games.

### AMERICAN EXHIBITORS IN PARIS SHOW.

PARIS, Aug. 20.—Entries for the eleventh annual Paris Salons, to be held in the Grand Palais during November and December, closed on Saturday, August 15, the total of the demands for space being quite equal to previous years. In addition to the numerous makers of machine tools who show their products through agents, America will be directly represented by Ford, Cadillac, Buick, Goodrich tires and Rushmore searchlights.

### THAT UNSANCTIONED BRIGHTON MEET.

The E. R. Thomas Motor Company, of Buffalo, has plainly indicated that it does not approve of the proposed unsanctioned race meet to be held at the Brighton Beach racetrack Friday and Saturday, September 11 and 12, under the auspices of the recently formed Motor Racing Association. The position of the Thomas company is set forth in the following letter, written by E. R. Thomas to the American Automobile Association, with authority to publish it:

"All the Thomas cars entered in the 24-hour race to be held at Brighton Beach, September 17th, have been withdrawn for the reason that the E. R. Thomas Motor Company cannot permit any of its cars, over which it has the slightest control, to participate in a race which has not received the sanction of the American Automobile Association, as it would disqualify our cars and our drivers from all events outside of the metropolitan district.

"We believe that racing must be controlled by an authoritative body, and as the A. A. A. has been controlling racing for some years, we see no reason why the conditions should change. In assuming this position, I feel as if we voice the sentiment of the largest majority of manufacturers, without whose assistance races cannot be successfully run.

"Under instructions, H. S. Houpt has withdrawn his entries in the Brighton Beach race."

(Signed) Edwin Ross Thomas,  
President E. R. Thomas Motor Co.

Nevertheless, it is said that while H. S. Houpt has not yet entered a car, he will do so if arrangements can be made to obtain one. It is now understood that a total of 14 cars has been guaranteed, two each from the following firms: Wyckoff, Church & Partridge, Lozier Motor Company, Fiat Import Company, Renault Frères Selling Branch, Palmer & Singer, C. M. Hamilton, representing Isotta, and L. C. Moskovics, Allen-Kingston. Report has it that both A. A. A. and A. C. A. officials are prominent in the management of the meet, among the former being Charles Jerome Edwards, president of the Long Island Automobile Club. However, Mr. Edwards is at the present in California, and from a close personal friend comes the statement that he is confident Mr. Edwards has not authorized the use of his name in this connection.

### QUAKERTOWN'S PROJECTED STOCK CAR RACE

PHILADELPHIA, Aug. 24.—With the 200-mile stock car race an almost positive fixture in the Founders' Week entertainment programme, the question has arisen as to whether to run the affair under the sanction of the A. A. A. or under the rules of the A. C. A. The feeling in this city among automobile club members generally seems to be that the race should be run under the rules of the A. A. A.

Meanwhile preparations for the event are going on, and this despite the fact that official permission to use the Fairmount Park roads has not yet been given. But the Mayor is strongly in favor of it; so are his directors, many Councilmen and last, but not least, "Jim" McNichol, the "boss" of the city, who owns several cars and will do all in his power to boost the game.

### RULES FOR SAVANNAH'S LIGHT CAR RACE.

Rules for the light car race which the Automobile Club of America proposes to run at Savannah on Wednesday, November 25, the day preceding the date of its proposed race under European rules, have been formally adopted by the club's contest committee. The race will be 200 miles and over a ten-mile course. Cars will be limited to a minimum weight of 950 pounds and a maximum bore of 3¼ inches for four cylinders.

### ELLIOT SHEPARD IN BOLOGNA RACE.

PARIS, Aug. 20.—America will have a representative in the Bologna race to be held in northern Italy next month under Grand Prix rules, owing to the overturning of the Bayard-Clement car, which finished fourth at Dieppe, and the injuring of driver Rigal. Elliot F. Shepard will replace the French driver.



"Good Luck!"—From "Judge."

### HARTFORD DEALERS AT STATE FAIR.

HARTFORD, CONN., Aug. 24.—The original intention of the Hartford Automobile Dealers' Association to hold a show under a large tent during the week of the State fair has been abandoned, and the exhibition will be housed beneath the roof of the skating rink at Luna Park, adjoining the Fair Grounds. The floor space is the same, and then it is a real polished floor, and at night the cars can be safely tucked away from marauders. That interest runs high in the forthcoming exhibition is evident from the fact that every square inch of space has been sold out and several local dealers who were a bit backward are left out in the cold, much to their disappointment, as the prospects are excellent for doing a large business.

Every effort is being made to secure all the old-time models possible for the historical section of the motor car parade in connection with the dedication of the new stone bridge across the Connecticut. The old Selden, Locomobile No. 1, Stanley's early steamer, and many others are being negotiated for. It is the desire of the committee to portray as accurately as possible the evolution of the automobile. It is also the intention to have every commercial car in use in this city to take part in the power-wagon section, and if expectations are only half realized, it will be one of the largest turnouts ever seen in this city. Much is also hoped for from the old-timers' section, as there are many eligible for it hereabouts, and it always serves to attract a large number of people who were not familiar with the automobile in early days.

### RELIABILITY RUN FOR INDIANIANS.

INDIANAPOLIS, IND., Aug. 24.—At a meeting held by the committee having the affair in charge, last Tuesday night, it was decided to hold the two days' reliability run under the auspices of the Indianapolis Automobile Trade Association, October 1 and 2. The route, as anticipated, will be to French Lick and return. The first day's run will be 140 miles and the second day's run 120 miles.

A technical committee, consisting of George A. Weidley, of the Premier Motor Manufacturing Company; W. A. Wall, of the National Motor Vehicle Company, and Howard Marmon, of the Nordyke & Marmon Company, has been appointed to arrange the rules, which will probably be similar to those used in the recent Glidden tour. All local manufacturers and dealers will have one or more entries, and it is believed that at least sixty cars will contest.

### A GOOD RECORD FOR ONE TOWN'S MEDICOS.

WORCESTER, MASS., Aug. 22.—Gardner, a town of 10,000 population, just north of Worcester, has ten physicians, all of whom acknowledge that for the requirements of their profession automobiles are more serviceable than horses. Drs. A. F. Lowell and W. H. Lyman are running Knox roadsters, Dr. W. H. Ellam swears by the Buick, and Dr. J. B. Donnelly has just bought a Chalmers-Detroit. They have sold their horses and buggies. The remaining six, with but one exception, have been out in different cars within the last week with a view of investing in a machine, and they will soon be converts in fact.

### THE PITTSBURG SIX FOR 1909 APPEARS.

The latest model from the shops of the Fort Pitt Motor Manufacturing Company, of New Kensington, Pa., has made its appearance on the road in the hands of Geo. von Rottweiler, its designer. One of the features of the new car is a very simple starting device, particulars of which, however, have not yet been made public. The motor has double ignition with Bosch magneto and Herz distributor with single coil. The change-gear is of the individual clutch type, the gears being always in mesh; the desired pair is engaged by means of a heavy four-jawed clutch. The internal and external brake drums have together 546 square inches of braking surface. Mr. von Rottweiler states that he recently made a trial trip across the Alleghany Mountains to New York and return in 56 hours' running time without any mechanical trouble, a few punctures furnishing the only exciting element.

Mr. von Rottweiler has resigned as managing and mechanical head of the Fort Pitt Motor Manufacturing Company, for the purpose of severing his personal business relations with some of the stockholders, and is reorganizing the company. He will hold a similar position with the new concern.

### AUTOISTS WILL HELP OHIO GET ROADS.

AKRON, O., Aug. 24.—Interest in improving highways in Ohio is being given a wonderful impetus by a combination of circumstances. One of the important influences lies in the state automobile tax imposed by the last legislature. Fred C. Caley, in charge of the state licensing department at Columbus, said:

"At the end of five years the state will have collected half a million dollars from motor car owners alone for the improvement of roads. I estimate that the total income this year, the first the new license law has been in operation, will reach \$100,000, and inasmuch as the licenses are issued annually only, the receipts ought to easily reach \$500,000. Besides, the legislature last winter appropriated \$560,000 for state aid to roadbuilding, and the income from the auto licenses is to be used in addition to that. In road building the State will contribute 50 per cent.

### A FAMILY EMIGRATING BY AUTOMOBILE.

Here is a modern illustration of the thrilling stories of romance and racing often written about the contests of "squatters" who rush for the government land openings in the West. Now, for the first time, it is believed, an automobile is to be introduced as an aid to reaching the most desirable homesteads first. W. G. Raish and family, of Clarks, Neb., have started on a two-thousand mile trip to the opening of the San Luis Valley reservation, which took place August 12 last. They travelled in their Rambler car and camped out every night. Their equipment, which includes tents, cooking utensils, and a gas range, is all carried on the car. The weight of the party is 740 pounds, and that of the outfit 1,400 pounds, a total load of 2,140 pounds.



W. G. Raish and Family in Their Rambler, Fully Equipped.



## STEARNS ANNOUNCES SHAFT-DRIVEN MODELS

CLEVELAND, Aug. 24.—For the coming season the F. B. Stearns Company announces a new shaft-driven model, which will be practically a replica of the 30-60-horsepower Stearns, as it will embody all the characteristic features of design and construction that have made a name on the latter. It will have a four-cylinder motor rated at 24-28 horsepower, annular ball-bearings throughout, and a shaft-drive of original design. Of equal importance is the announcement that for 1909 the well-known 30-60 four-cylinder model will be made with either side chain or shaft-drive, at the option of the purchaser, owing to the pronounced preference for the latter type.

Apart from this there will be little or no changes of importance in the design of the car, a number of which are now approaching completion in the Stearns assembling room. The Stearns six-cylinder 90-horsepower model will also be continued, practically without any change, but a comparatively small number of this large type will be built. In fact, there is no "quantity" talk about the Stearns plant, as quantity and low prices are elements quite foreign to the Stearns factory atmosphere. Every effort is directed toward the production of quality.

The Stearns shaft-drive presents some new features which make it of considerable interest. Mr. Stearns and his chief engineer, Mr. Sterling, have devoted their efforts to attaining the maximum simplicity with great strength, and an examination of the design shows that they have succeeded in no small meas-

ure. An interesting feature of the drive is that it is direct on both third and fourth speeds. The point to which the Stearns side-chain drive has been developed will, however, justify the company in retaining it in those cases where the purchaser prefers this type of power transmission. A great many owners of high-powered cars appreciate its advantages and will have no other.

Everything about the Stearns plant shows that attention is being centered on the production of cars, and though the factory is small, as compared with some of the show establishments of the country, it is one of the most complete of its kind to be found, the Stearns cars being built there from beginning to end. But for the past two years its resources have been severely taxed to keep up with the demand for cars, so that now additions are being made to the factory buildings, and a large order for machine tools has been placed. It is understood that the additional equipment comprised in the latter will place the Stearns plant in a class with the really important producers.

Up to the present time most of the Stearns product has gone to Eastern selling centers, Wyckoff, Church & Partridge, of New York, the Atlantic Coast distributors, taking more than half of the entire output of the factory, and they could have sold more if factory conditions had permitted an increase in the number of cars built. During the past season, however, Chicago has developed into an excellent Stearns market, and the demand from that center will be largely increased next season.

## POPE REORGANIZATION TO BECOME EFFECTIVE AT ONCE

HARTFORD, CONN., Aug. 24.—The Pope reorganization committee, consisting of H. Brommer, Frederick H. Ecker and August Heckscher, deeming it advisable that the reorganization should be brought about speedily, has fixed September 8 as the date on or before which the certificates representing the first and second preferred stock must be deposited with the Central Trust Company of New York. The notice to this effect that is being sent to all stockholders is as follows:

"The committee, acting under the plan and agreement of reorganization dated July 15, 1908, gives notice that there has been deposited with the Central Trust Company of New York more than 60 per cent. of first preferred and more than 35 per cent. of second preferred stock. As the committee deems it advisable that there should be a speedy reorganization, it has fixed September 8, 1908, as the date, or before which the first and second preferred stock must be deposited.

"Attention of the stockholders is called to the fact that the right given to acquire proposed notes of the new company, and in addition 50 per cent. of the principal of the notes acquired in par of new stock at a cost of the par of said notes and accrued interest, is conferred upon the depositors of stock, and that no such right is given to the holders of undeposited stock."

Under the plan of reorganization announced July 30 it was stated that participation under this plan in any respect whatever is dependent upon the deposit of securities with the Central Trust Company of New York within such time as may be fixed by notice from the committee. Colonel George Pope stated to-day that, in accordance with this plan, the notice setting the date at September 8 is being sent out. Those whose stock is not deposited by that date will not come in under the reorganization and will thus lose all interest in the company.

## GOVERNOR FORT TO OPEN NEW JERSEY CONVENTION

NEWARK, N. J., Aug. 26.—Co-operation of the highest State official is assured the automobilists and farmers for the good roads convention that will be held at Atlantic City, September 25 and 26. Governor Fort, of New Jersey, will make the opening address. The committee in charge of the promotion of the convention is a representative one. It is made up of George W. F. Gaunt, master of the State Grange; H. B. Cook, of the Associated Automobile Clubs of New Jersey; H. A. Bonnell, ex-secretary of the New Jersey Automobile and Motor Club, and Albert Heritage, a member of the executive committee of the State Grange.

A novel and efficient object lesson is planned for freeholders, mayors, road officials and editors. It is nothing less than to carry them to the convention in automobiles, which, to the number of one hundred, have been pledged by the members of the Associated Automobile Clubs of New Jersey and the New Jer-

sey Automobile Trade Association. The runs will start from all sections of the State and go over the roads, both good and bad, within its boundaries, thus arousing the influential men of the State to the benefits of good roads and contrasting them with the obstacles of unimproved highways. Especial emphasis will be laid on the desirability of building continuous routes. Joseph H. Wood, of the local club, will be in charge of the project, in which President Paddock and W. H. Ellis, in behalf of the Trade Association, will co-operate.

Governor Fort was given the other day a taste of the speed-trap graft that is prevalent throughout the State, by running into one himself at Point Pleasant and suffering arrest. The trap in question is declared by automobilists to be an unjust one. They instance the arrest of a man traveling at ten miles an hour, which the constable insisted was a thirty-mile rate and was upheld by the court.

## NECESSARY FEATURES OF PROPOSED AUTOMOBILE LEGISLATION

IN view of the fact that several States are contemplating changes in their automobile laws for the purpose of stopping reckless driving over public highways, and at the same time giving the reasonable motorist his just dues, an interview with Walter S. Schutz, counsel for the Connecticut Automobile Association and the man who drafted the present Connecticut automobile law, which is considered a very sane statute, is timely.

"Limitation of speed," said Mr. Schutz Monday, while at the headquarters of the American Automobile Association, 437 Fifth avenue, New York, "was the sole purpose of our earlier statutes; next the identification of the car was considered of importance; then the control and responsibility of the individual operator became the main object of the law. The time is not far distant, in my opinion, when revenue will be the chief, if not the sole reason for automobile legislation. The fact that high-powered cars seriously injure the roads make it necessary to collect an ample revenue from automobilists and apply this to the maintenance of present roads and the new ones.

"There are four points which the model law must cover, viz: proper identification, control of operator, reckless driving provisions, and a clause which will prevent the establishment of traps where the law-abiding motorists are caught on technical violations and through which the speed maniacs easily escape in their high-powered machines.

"My personal opinion is that the examination of drivers, either professional or amateur, avails nothing, and is only a needless expense to the State. Indeed, I believe statistics will bear me out when I say that the great majority of accidents result from the reckless driving of experts, rather than from the ignorance of novices. I do not think we should make any distinction between private operators and professional chauffeurs.

"Public sentiment is opposed to all forms of highway robbery, and in nine cases out of ten a speed trap is operated for no other purpose than to catch a driver and hold him for a technical violation. Each day it is becoming more apparent that the only true test of proper operation is to determine the speed at a

particular time, and to take into consideration the width of the highway, the amount of traffic, and the number of pedestrians and the houses along the highway.

"The Connecticut law, which has proven very satisfactory to all classes of citizens and to visiting as well as resident motorists, provides that no person shall operate a motor vehicle on the public highway recklessly, or at a rate of speed greater than is reasonable and proper, always having a regard for other property and for life and limb. Convictions under the new law have been secured under difficulty in cases where the operation of the car was improper, and the Connecticut authorities are holding the reckless in better restraint than they are held in any other State where the automobile laws are based upon speed limitations. An abstract of each conviction is furnished the Secretary of State, and in flagrant cases the Secretary of State has the power to revoke the license of the driver. It is significant that up to this time none of the reports from the courts have recommended such action on the part of State officials.

"A very important feature of the model law is the fair and liberal treatment of non-residents. In Connecticut non-residents are admitted for a period of not more than ten successive days, provided, of course, they carry a license from the States from whence they come.

"As to revenue, it seems to be reasonable to suppose that the automobilists can afford to bear the burden of the reasonable check, provided he is not unjustly hampered in the use of his car, and also feels that the money which he pays is to be used in maintaining the roads. With their constant increase in number, the power of automobilists to properly influence legislation is enormous. If the State automobile associations and the local clubs will work systematically to secure simple and uniform automobile laws, the remaining barriers between States will soon fall away, and petty and needless restrictions upon the proper operation of automobiles will disappear. But this state of affairs cannot be brought about without the co-operation of the great body of motorists at large in suppressing the reckless element."

## PROBLEMS OF SUPPRESSION OF DUST ON PUBLIC ROADS

WASHINGTON, D. C., Aug. 24.—Under the caption "Dust Preventives," Logan Waller Page, director of the Office of Public Roads, has prepared for the Department of Agriculture, an elaborate paper in which he goes into this important subject very fully. The following excerpts from this paper will interest automobilists generally:

The most important problem which has confronted highway engineers in recent years is the suppression of dust on roads. Not until the introduction of motor vehicles, however, did this become a factor of sufficient importance to engage the serious consideration of road builders and road users. Fast motor traffic has reached such proportions at the present time as to shorten the life of our most carefully constructed and expensive macadam roads to a great extent, and to keep them in a loose and uneven condition. Before entering into a detailed discussion of the damage to roads from automobiles and methods for its prevention, it may be well, for the sake of those unfamiliar with the subject, to consider its cause, and why the situation has become so serious of late.

The macadam road has been developed with the object in view of withstanding the wear of iron-tired horse vehicles, and it has met successfully the demands of suburban and rural traffic until the advent of the automobile. When in its highest state of perfection, the rock from which such a road is made is so suited to the volume and character of traffic which passes over it that only an amount of dust is worn off sufficient to

replace that removed by wind and rain. The dust remaining should be just enough to bind the surface stones of the road thoroughly, forming a smooth, impervious shell.

When such a road is subjected to continuous automobile traffic, entirely new conditions are brought about. The powerful tractive force exerted by the driving wheels of automobiles soon disintegrates the road surface. The fine dust which ordinarily acts as a cementing agent is thrown into the air and carried off by wind or is easily washed off by rains. The pneumatic rubber tires wear off little or no dust to replace that removed by natural agencies. The result is that the stones composing the road become loose and rounded, giving the greatest resistance to traction, and water is allowed to make its way freely to the foundation of the road.

Many remedies have been suggested and tried for meeting this new condition, but a perfectly satisfactory solution of the problem is still to be found. Some success has attended the efforts of those who have sought to find a cure for the evil, and this is encouraging when the many difficulties to be overcome in the treatment of thousands of miles of roadway are considered. It is apparent that this problem can be solved only by the adoption of one or two general methods: (1) By constructing roads in such a manner and with such materials as to reduce to a minimum the formation of dust; and (2) by treating the surfaces of existing roads with materials that will give the same results without the necessity of rebuilding.



## WHAT IS GOING ON AMONG THE CLUBS

### BAY STATERS MAKE GOOD THIRD MOVE.

BOSTON, Aug. 26.—It is said that three moves are as bad as a fire, but this well-known aphorism surely cannot apply to the Bay State Automobile Club, which this week made the third move in its history, taking possession of its fine new clubrooms in the Hotel Carlton in upper Boylston street. When the club was organized it located in the Hotel Lenox. Outgrowing these quarters, it went to Auburndale and for a time occupied a part of the Woodland Park Hotel. The next change was to the finely equipped clubhouse on Dartmouth street, where it has been located for some years past.

For the occupancy of the club the management of the Hotel Carlton has rebuilt a large part of the street floor of its building and has constructed a private entrance from the Hemenway street side, so that to all intents and purposes the clubrooms are as exclusive as if in a separate building, while the members have the great advantage of the hotel service both for the ordinary club purposes and for the restaurant, which is entirely separate from the hotel restaurant. The new clubrooms consist of six apartments, three of which are very large, one of them having been made by tearing out a half dozen or more ordinary hotel rooms. There are no sleeping accommodations in connection with the clubrooms, except the secretary's room, but the hotel offers all that could be desired in this respect. All the rooms have been rebuilt and refinished under the personal direction of Secretary James Fortescue and the board of directors, and the result is most pleasing. This move on the part of the Bay State Club has been effected just in time to have the new quarters ready for the opening of the fall season, with its numerous activities in the shape of contests and other events to be held in the next two months.

### AVON MOUNTAIN FOR HARTFORD CLIMB.

HARTFORD, CONN., Aug. 24.—The Automobile Club of Hartford, through its committee, has scoured the country round in an endeavor to locate a "real" hill. Last year's climb was the initial event for the local club, and was in every way a success. It was thought that the same course might be used this season, but after the experience of the recent endurance run the contest committee was firmly convinced that there were other steep grades and far better adapted to a test of climbing capability. Recently, H. P. Maxim, chairman, W. C. Russell and C. H. Gillette, of the contest committee made a trip to Avon Mountain for the purpose of going over the proposed course, and as a result of their investigation of its possibilities as the venue for a hill-climb, it is more than probable that it will be selected for the purpose, as it affords a rise that will provide a hard test for the cars without any danger.

The Avon course is of fairly good surface, being a succession of sharp turns, level stretches and sharp rises; in the latter respect it is much like Dead Horse hill. The distance from start to finish is a little over a mile. October 17 is the probable date for the climb.

### CONNECTICUT'S STATE BODY MUCH ALIVE.

HARTFORD, CONN., Aug. 24.—Secretary G. K. Dustin, of the Connecticut Automobile Association, has notified the various clubs throughout the State, as well as elsewhere, of various roads now being or shortly to be repaired. The "hen-coop" bridge stretch is to be repaired immediately, and during the period of reconstruction motorists will not be able to drive from Springfield to Hartford or vice versa on the west side of the river. Coming from the north, motorists must cross the bridge at Windsor Locks, if coming down on the west side, completing the balance of the trip on the east side. The trip can be made from the north by the east side entirely if desired. This stretch is the New York to Boston one and on leaving Hartford the east side of the river should be taken.

In the immediate future the seven-mile stretch of macadam is to be laid down on the New Haven turnpike between Hartford and Berlin. This route should not be followed for at least three weeks to come, if not longer. In Branford motorists should follow the shore road and avoid the high-



A MID-SUMMER RUN OF THE BLUE GRASS MOTOR CLUB.

From Lexington to Paris, Ky., through the blue grass region, the county has fine roads, over 85 miles being included of solid well-oiled and well-kept roads, over which it is a delight to drive.

way passing the driving park, as it is now ripped up and will be for some time to come. Leaving New Haven due north for Hartford, Springfield and Boston, motorists should keep on the left-hand side of the river coming up to North Haven as far as Yalesville and then on through to Tracey, or, if desired, the bridge may be crossed at Wallingford, then across the railroad tracks through Wallingford to Hartford. The North Haven stretch is the one between the towns of North Haven and Wallingford, which has been bitterly complained of of late.

The membership of the Connecticut association has been increased by the admission of the newly formed Litchfield County Automobile Club of Torrington, with 116 members. There are now seven active clubs.

### A PROGRESSIVE PENNSYLVANIA CLUB.

NORRISTOWN, PA., Aug. 24.—Scarcely more than a year old, the Norristown Automobile Club is certainly the most lusty infant in the game. Not content with pulling off successful endurance runs and record-breaking hill climbs, just like the

big clubs in the large cities, this youthful but energetic organization is now in a fair way of having a club house of its own. At its next meeting the club will consider the offer of Lewis E. Taubel, one of its prominent members, to take over a large modern stone mansion on the Ridge pike, above Jeffersonville, and convert it into a club house, which can be done at comparatively small expense, as the building is adapted in every way for the purpose. In addition to the house proper the handsome grounds surrounding it are admirably suited to the purposes of golf links, of which ancient Scotch game the club contains many admirers. The enthusiasm among the members over the project practically insures the success of the new venture, and it only needs the official sanction of the club to put the deal through.

#### BRIDGEPORT CLUB IS WARNING SPEEDERS.

BRIDGEPORT, CONN., Aug. 24.—The Bridgeport Automobile Club has begun a campaign against excessive speeding in the city limits. Residents of Connecticut avenue, a much-traveled thoroughfare which forms the eastern approach to the city, have made many complaints about this, with the result that the club's public safety committee placed flagmen on this avenue and handed all automobilists cards asking that a reasonable speed be maintained. The committee has also sent out circular letters to the members of the club requesting them to join in supporting the law, which is one of the most liberal in the country.

#### A. C. OF MARYLAND DRAWS UP A NEW LAW.

BALTIMORE, MD., Aug. 24.—Osborne I. Yellott, counsel for the Automobile Club of Maryland, is preparing a bill to be presented to the next Legislature, the object of which is to put an end to reckless driving in this State. It provides that no person shall be allowed to drive an automobile until he has gone before a competent jury and passed a rigid examination as to his fitness. President James S. Reece, of the club, believes that stringent legislation is now absolutely necessary. As the legislature does not meet for some time to come, the club will endeavor to have a similar ordinance passed by the City Council of Baltimore to give immediate relief to the city.

#### SPRINGFIELD'S SEPTEMBER CLIMB.

SPRINGFIELD, MASS., Aug. 22.—The following officials have been selected by the Automobile Club of Springfield to have charge of the automobile hill climb contest, to be held September 11 on Wilbraham Mountain, near this city:

Judges.—J. C. Kerrison, Boston, Bay State Automobile Club; Frank G. Webb, Brooklyn, vice-chairman of the racing board of the A. A. A.; A. G. Batchelder, New York, and S. L. Haynes, Automobile Club of Springfield.

Referee.—C. H. Gillette, Automobile Club of Hartford, Conn.

Starter.—Fred J. Wagner, New York.

Assistant Starter.—J. H. Bartlett, Automobile Club of Hartford.

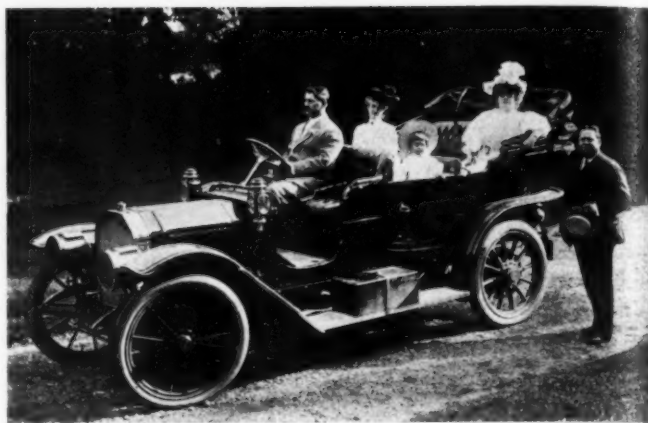
Official Timers.—Timers Club of New York.

Clerks of Course.—To be elected from members of Springfield club.

Six cups have already been donated for competition in the climb, as follows: Worthy Cup, Cooley Cup, Massasoit Cup, Norcross & Cameron Cup, Ericka Cup, President's Cup, Mark Aitken, president of the Automobile Club of Springfield.

#### THAT INTERNATIONAL ROADS CONGRESS.

LONDON, Aug. 20.—Britishers will take an active part in the first International Roads Congress, to be held in Paris from October 11 to 18, under the patronage of the French government, for in addition to a delegate appointed by Parliament several papers will be read by the English delegates. Colonel Crompton will deal with "Improvements in Self-Propelled Vehicles so as to Reduce Road Wear;" the Hon. C. S. Rolls will deal with "The Effect of the Road Surface on the Vehicles;" Lord Montague has taken for his subject "The Value of Good Roads;" Rees Jeffreys deals with "Systems of Highway Administration Compared—Their Influence on Cost and Efficiency."

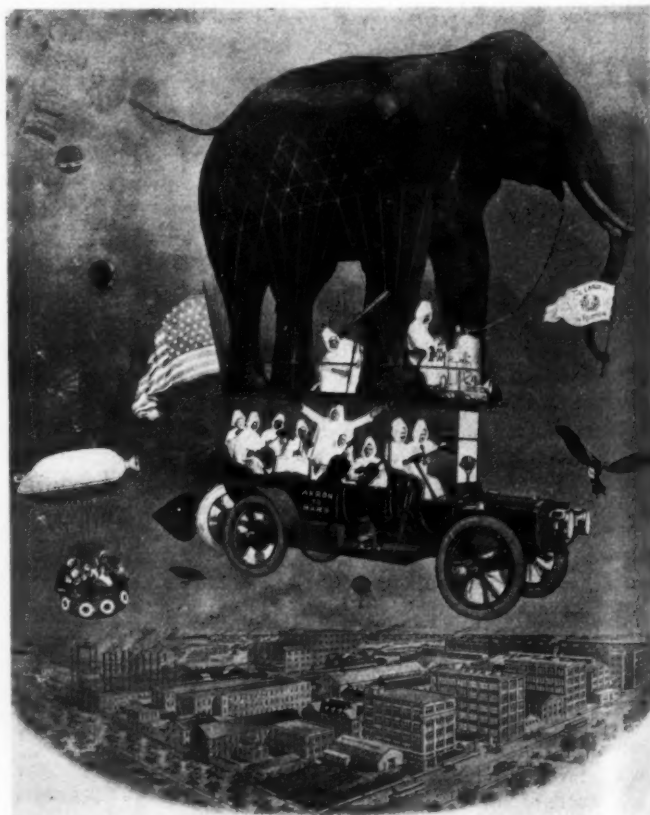


A De Luxe Party in Detroit.

D. W. Kaufman, general manager of the De Luxe Motor Car Company, and his wife and child in front of their home on Woodward avenue, Detroit.

#### FRAYER-MILLER TAXICABS NOW IN FIELD.

Among the first representatives of the air-cooled type of car to enter the taxicab field are five Frayer-Miller cars made by the Oscar Lear Automobile Company, Springfield, O., which are now running around the streets of New York City in regular service. This new addition to the Frayer-Miller line is not a touring car made over to adapt it to the purpose, but has been specially designed with a view to this exacting form of service. The power plant consists of the regulation 24-horsepower Frayer-Miller, air-cooled motor, on which the blower is belt-driven, thus making it noiseless. The motor is so installed that it may be removed and a new one put in its place in less than an hour, and the same thing is also true of the rear axle driving unit, which is of the heavy type manufactured by the Standard Roller Bearing Company, and having a three-speed gear set in combination with the differential and axle. An extension top is provided and can be let down or removed in a few minutes.



Goodrich Rubber Company's Airship—"Akron to Mars."



## GOOD ROADS ACTIVITY IN SOUTHERN CALIFORNIA

LOS ANGELES, CAL., Aug. 20.—Unless the East looks most promptly to her laurels and interests, the far West seems in a fair way to outstrip her in the race for good roads, which within the last twelve months has got going so auspiciously in almost every populous State of the Union. On July 30, at an election, the electorate of Los Angeles county, California, put through by a vote of over three to one a bond issue, having for its avowed purpose the immediate expenditure of \$3,500,000 on a comprehensive system of scientifically-built county highways, totaling 307 miles. To the casual newspaper reader the brief accounts of this progressive action by an enlightened community might seem to possess only passing interest, but a more critical analysis quickly develops facts and conditions of extraordinary significance.

For one thing, let it be considered that the amount of this appropriation so unanimously made by the people of a single county of the Golden State is one-fourteenth as great as the total demanded for the entire country by the Brownlow bill, which only three years ago was defeated by the solons at Washington, on the ground that it was too terribly extravagant to squander \$50,000,000 on improving the national commonwealth with good roads. For another, let it be understood that the fact of its limitation to a single county must not obscure the importance of this newest highway appropriation, for Los Angeles county is very nearly as large as is the State of Connecticut, is twice as large as Delaware, and four times as large as Rhode Island.

That the appropriation must mean really good roads is assured by the liberal basis on which it is figured. The \$3,500,000 divided by 307 (the total mileage) comes to \$11,400 a mile—a sum amply sufficient to the building of the type of highways that make of Europe a paradise for touring autoists. And it is just this type that it is intended to construct, for the waste of good American dollars abroad by seekers for good automobile going has been coming home more and more to the business interests of Southern California—a section which finds both growth and prosperity in an increasing touring contingent.

Already a start has been made on the kind of good roads it is proposed to build, the magnificent Huntington boulevard between Los Angeles and Pasadena being now well along towards completion. This boulevard is about ten miles in length, and besides having wide turns and easy gradients, is of ample width and splendid surface. A perfectly graded and lightly crowned foundation of unusual thickness is the basis of this example of good roads building, while the top dressing is a highly durable sort of "oiled macadam"—a dust, mud and wear-proof surfacing that secured the evenness of asphalt without its slipperiness and perishability. All of the new 307 miles will be similarly built and surfaced, the work being in charge of A. E. Loder, a United States engineer, who, for his expert knowledge of road making, was recommended to the authorities of Los Angeles county by Secretary Taft.

As for the perils of graft and misappropriation, these will be minimized by the wide publicity given the enterprise and by interested watchfulness of many and various powerful organizations, such as the militant Automobile Club of Southern

California, which, with a membership of some 1,400 strong, is a power to reckon with in the affairs of the great Southwest. Indeed, in no part of the country are automobile interests more powerful than in California, in which there is an automobile to every one hundred of the population. No other State has anything like such a proportion.

### Automobile Club of Southern California Is a Power.

Los Angeles has many more automobiles than any other city in the world of anywhere near its size, while the State list is increasing at the rate of 600 a month, despite a total population of only 1,800,000. Moreover, the good roads sentiment in California is on a commensurate basis, as is witnessed by the fact that other counties of the State are on the verge of putting through heavy bond issues for road building. In this way it is fully expected to attract many Eastern autoists, a proportion of whom will, of course, be certain to become permanent residents.

Probably nothing better impresses upon one the magnitude of the Los Angeles county road plans than a consideration of what these plans would involve if extended proportionately to the entire United States. The population of Los Angeles county is about 350,000, so the bond issue of 3,500,000 is equivalent to \$10 for each individual in the county. On the same basis, the population of the whole country being about 85,000,000, \$850,000,000 would be required to provide all of the United States with as much good roads in proportion to population as Los Angeles county is on the verge of realizing. Or, to figure on a basis of proportionate area, that of California country is one-eight-hundredth of that of the nation, which would require \$2,800,000,000 to provide the entire area with roads of similar extent and quality.

The method of providing so considerable a sum of money without working hardship to the taxpayers should be of interest to many communities. The total assessed valuation of all property in the county being about \$300,000,000, it was arranged that the payment of principal and interest on the bonds should be distributed over a period of 40 years, requiring the addition of only 40 cents per \$1,000 per annum to the tax rate. In other words, on each \$1,000 worth of property a total of \$16 is to be paid in 40 annual installments of 40 cents each, so if property now worth \$1,000 is, in the course of 40 years, enhanced by good roads to a value of more than \$1,016, an entry on the profit side of the ledger is assured.

A more immediate result is the prompt importation to the county of \$3,500,000 of good Wall Street money, which will be expended at once and the benefits of its expenditure enjoyed, while it will not have to be repaid for 40 years.

One advantage of a lump appropriation of this kind and its immediate expenditure for a system of roads is that an ideal uniformity of scientific planning and construction is thereby permitted. Surveying corps will be organized, rock quarries opened, machinery purchased and small armies of laborers hired on the most efficient and best organized basis possible. Then, when the new system is completed, the regular annual county road appropriation will be wholly available for road maintenance and the building of minor laterals.

## LOUISIANA INTENDS TO HAVE GOOD ROADS AT ONCE

NEW ORLEANS, LA., Aug. 24.—The first work of the Good Roads lobby of the Louisiana Automobile Association has been to introduce a bill into the legislature creating a State tax for automobiles and to license all chauffeurs, who must first pass a strict examination. All taxes and licenses are to be turned into a good roads fund, for the improvement of the roads.

The bill has met with instantaneous favor all over the State, and there is no doubt of its passage. Autoists are to a unit in its favor, and the licensing of the chauffeurs is the part that has met with favor with the general public. Especially is this so among the farmers, who are not altogether reconciled to the "smoke wagon" as yet. They are naturally in favor of anything

that will insure better and more careful driving of cars. Then, too, the good roads proposition is one in which they are all greatly interested. And as the major portion of the legislators are from the rural districts, the bill has been admirably drafted.

The Louisiana Automobile Association is, perhaps, the only

one of its kind in the South that is keeping a lobby at its legislature. All of the plans of this lobby for this session and for the whole summer are towards the good roads proposition. Good roads are the one thing necessary to make the South the Mecca for tourists, and they have gone about with this idea in view.

## PENNSYLVANIA HIGHWAYS ARE RAPIDLY BEING IMPROVED

THE work of the reconstruction of Pennsylvania roads is now making more rapid progress than at any time since the organization of the State Highway Department by Highway Commissioner Joseph W. Hunter late in 1903. Although actual work on the construction of state roads did not begin until 1904, there had been constructed up to August 1, 348 miles of improved road, and there were under contract or in course of construction, no less than 325 miles. In addition, surveys have been made and are now being made for many additional miles of state highway. During these five years every county has made application for the reconstruction of some of its roads, many turnpikes being abolished in order to secure state aid. New roads have not been built in every county, however, because the supervisors of townships have not always followed up the projects after surveys and estimates had been made.

Both Governor Edwin S. Stuart and Highway Commissioner Hunter are strongly in favor of better roads connecting with all the important cities of the state, and of the reconstruction

of the old state road leading from Philadelphia to Pittsburg. This is a pet scheme of Governor Stuart's and it is likely that the next Legislature will be asked to make a big appropriation for the reconstruction of this old national highway. From this it is proposed to have state roads running to the county seats throughout the State.

The Pennsylvania State Highway Department grew out of a force of four men, named in 1903, and is now constructing roads at a rate which, if continued, will put Pennsylvania ahead of all other states within a few years. The yearly construction is now considerably ahead of New York, which has been building roads for ten or twelve years, and is in advance of Massachusetts and the states of the Middle West, which are paying close attention to road building. Pennsylvania's roads have been a bitter experience for touring automobilists and a source of much mortification for residents of the state, but within a short time its citizens can invite tourists to visit Pennsylvania on roads as good as any in the United States.

## MINNEAPOLIS ROAD-MAKERS DISCUSS DUST PROBLEM

MINNEAPOLIS, MINN., Aug. 22.—Experiments in road-oiling and surfacing, conducted by the park authorities of the principal cities in the country, were the subject of exhaustive reports made at the annual convention of the American Association of Park Superintendents in session at Minneapolis. The first paper upon the subject was read by Superintendent M. H. West, of Lincoln Park, Chicago, and this was followed by the statement of the experience of other park directors in attempting to find a dustless and automobile-resisting surface for the city drives. Mr. West reported that he had obtained the best results with an emulsion residuum and paraffin oils. By the Chicago formula the oils are mixed in the proportion of one part residuum of about 1.9 specific gravity with three parts paraffin base fuel oil. One part of the mixed oils is then combined with nine parts of hot water, to which naphtha soap is added in the proportion of 15 pounds to 500 gallons of water. Roads treated with five applications of this emulsion came through the winter in good condition. J. W. Rodgers, of Cincinnati, gave the experience of the park board of that city with a preparation similar to that described by Mr. West, but containing 25 pounds of soap.

For dust laying in cities where there are extensive stretches of gravel and dirt roads, but little macadam, a light paraffin

oil is the best. Minneapolis is in this class, and Superintendent Wirth and City Engineer Rinker presented the city's problems to the convention. The park board is now using a paraffin oil, and dressing afterwards with sand. Clay roads in Kansas City have caused trouble in the use of oil there. Superintendent W. H. Dunn stated that it could not be used on the clay driveways unless the surface was well bonded and solid; and that on hills the oil made the roads too slippery for horse traffic. Experiments are now being made to overcome this.

Mr. West declared himself opposed to ordinances against the use of chains and other anti-skid devices. He said that he believed that the damage done by these devices to the road surface had been much exaggerated. Assuming that the damage is caused by the release of a vacuum formed by a flattened tire and by the slipping of the tire under the tractive force exerted by the rear wheels, it is obvious that any device which would tend to prevent this vacuum, or to decrease the sheering stress, would help in a degree to maintain the road, rather than the reverse. However, Mr. West said, these effects were exerted to some degree even when chains are used, and he mentioned this point only to bring out that it did not seem justifiable to prohibit the use of devices by which public safety is guarded, when only a questionable harm to public property is averted.

## OHIOANS WANT AN ENDURANCE RUN AND A BOULEVARD

TOLEDO, O., Aug. 24.—Efforts of local automobile dealers are now centered in arranging for an endurance run which will take place toward the close of this month. The affair will be entirely local, in that it will be confined to Ohio, being the first of its kind to be pulled off within the confines of the Buckeye State. Plans already perfected call for a three days' run, starting from Toledo, going to Columbus for the first day, from Columbus to Cleveland for the second, and from Cleveland to Toledo for the third. No particular efforts will be made to secure speed, but, in the main, the same general regulations

will be observed as those in the Glidden tour. Practically all the factories having local agencies have arranged to participate in the proposed endurance run.

The very pretentious idea of constructing a grand boulevard from Cleveland through Toledo to Detroit is now receiving some attention in this section. The total distance is about 150 miles, a portion of which could easily be built at small cost. The Toledo Chamber of Commerce has taken interest in the undertaking, and it has ascertained that the road desired could be built at a cost of about \$7,000 per mile.

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The Rambler Demonstrating Car Tackling the Steep Grade at Lemont.

**Rambler Climbing Stunts.**—A remarkable story comes from the Chicago representatives of Thomas B. Jeffery & Co., about the performances of their Rambler demonstrating car. They claim to have found the steepest hill in the Middle West near the town of Lemont, Ill., its grade being 50 per cent. In a recent demonstration a four-cylinder Rambler carried five people up this hill. When half-way up the brakes were put on, locking the wheels, but the car slid back eleven feet of its own weight. The incline was so steep that the passengers in the tonneau could not stand.

**Chadwick Wins More Honors.**—According to dispatches received by H. B. Larzelere, general sales manager of the Chadwick Engineering works, at the Philadelphia branch, the Great Chadwick Six achieved more hill climbing honors by beating out the field in the Ohio Valley Automobile Club's free-for-all at Wheeling, W. Va., last week. The car was entered by A. W. Paul, an amateur owner and driver, and the Chadwick makers knew nothing of his entry and victory until he wired them concerning it as follows: "My Chadwick won hill-climb race to-day at Wheeling in 2:42½; White steamer driven by Paul Melchert finishing second." The event was the principal one on the club program for the day and was held on Campbell's Hill, which is a stiff and winding grade of 1 1-3 miles. By finishing first Mr. Paul and his Chadwick become the possessors of the silver trophy offered by the club.

**Continental in Australia.**—Word comes from the home factory of the Continental Caoutchouc Company, Hanover, Germany, that word has been received there of a trip across Queensland, Australia, by the Hon. J. W. Blair in a Panhard equipped with Continental tires. These were 150 mm. rear and 125 mm. front, and although the roads, where there are any, are extremely rough, the tires came through the 3,000-mile trip with but little perceptible wear, no replacements having been found necessary throughout the entire distance, over stretches never seen by an auto.

**Big Carburetor Contract.**—F. H. Wheeler, of Wheeler & Schebler, manufacturers of the Schebler carburetor, recently closed a contract with the Buick

Company, of Flint, Mich., for 21,000 carburetors for the Buick 1909 product.

**Field for Large Cars.**—"There is still a large field to be filled by automobiles of the pleasure car type, and it is a mistake to think that the demand has nearly reached its limits," says James Joyce, manager of the American Locomotive Company's automobile department. "There is a demand of remarkable proportions for low-priced cars from persons who never owned a car before, and there is still an astonishing number of well-to-do persons who have not yet joined the ranks of the automobilists. Many of the latter will have nothing less than the very best when they get ready to buy, and the demand from them for cars of distinctively high quality will be added to that steady demand for cars of the exclusive class which comes from those who have had from one to four years' experience with various grades of cars, and have learned the economy of buying what costs least to maintain regardless of the initial price."

**Shock Absorbers en Tour.**—The "Shock Absorbers," a band of Philadelphia automobile writers, will journey to the Vanderbilt elimination trials in October in a White steam opera 'bus, camping out on the road. They will carry a tent and a chef, with a full commissary department, and will be delightfully independent of the grasping Long Islanders. All will be dressed in white suits, caps and neckties, and the car will be dubbed "The Water Wagon." The party will include Harry Lasher, E. K. Gilchrist, Jack Hiscock, H. McK. White, Richard Kain, John A. Cleary, E. H. Leach, George W. Daly, W. Blackman, Clyde Woolson, Robert Turner, H. W. Sharp, I. C. Minford and Harry J. DeBear.

**Maxim's Noiseless Gun Tested.**—Official tests of Hiram Percy Maxim's new noiseless rifle were made at Springfield, Mass., a few days ago, and showed that while the ordinary rifle could be heard 3 1-4 miles away, the Maxim rifle's only indication of its presence was a mere click, not distinguishable further than 1,500 yards away. The tests were made at the "Sixteen Acres" range, under the supervision of Major Kenneth Morgan, U. S. A., and proved very satisfactory.

**Where Prominence Has Its Drawbacks.**—"It must be very fine to so predominate in your field of manufacturing that when anybody thinks of a 'steam car' they think of the White," said a prominent gasoline car manufacturer a few days ago to Windsor T. White, president of The White Company. "It is a fine thing, and yet there are times when we wish that the public would keep in mind that there are other makes of steam cars," replied Mr. White. "As you well know, in the early days of the industry, a lot of steam automobiles with ordinary boilers were built by incompetent people. Most of these cars, of course, went to the scrap-heap long ago. But every once in a while some one digs up one of these obsolete steamers and fixes it so that it will run. Sooner or later—generally sooner—something happens to this 'steam automobile,' and we are more than likely to get the discredit for it. For example, about two weeks ago an old Geneva steamer blew up near Painsville, O., with disastrous results. The published reports of the accident spoke of a 'steam machine blowing up,' and some people who do not know our car and who, therefore, do not realize that such a thing is an absolute impossibility with the White, thought that one of our machines was involved. If these people had given any thought to the old crude steam cars, they would undoubtedly have placed the blame where it belongs."

**Bretton Woods, N. H., Garage.**—With the exception of the garage in Boston which was made from the old depot of the Boston & Albany Railroad, the establishment at Bretton Woods is said to have the greatest amount of floor space that any establishment of the kind in the country can boast, while it is said that its daily business is equal to that of the largest metropolitan garages. With its 30-foot aisle, extending 220 feet from door to door, and its two long lines of cars in their "stalls" against each wall, the garage is a sight for the curious, as the cars are constantly coming in and out. In the rear there is a 55 by 60-foot machine shop.

**Minnesota Road Law Void.**—The Minnesota Supreme Court has declared the county superintendent of highways law, enacted in 1907, unconstitutional, on the ground that it is not general legislation, as it applies only to counties of under 200,000 population. This law abolished the system of road supervisors selected by township and county boards, and provided for the appointment of county superintendents at a proper compensation. Experts had been appointed in many counties, and systematic road improvement was being undertaken. Steps will be taken at once to frame a new law.

**Another Parts Maker.**—The McCue Company of Hartford, Conn., which has been building gears and work in the white for the wholesale carriage trade for fifteen years, is adding automobile parts to its line. It will supply everything which enters into the construction of an automobile, including all kinds of forgings, brake and control levers, hubs, bearings, I-beam front axles, and floating type rear axles.

**Touring in California.**—The California Promotion Committee is prepared to supply, without cost, to all persons interested in California, and who intend at some time to make an automobile trip in that state, full particulars of the routes, with photographs, maps, guides, and other valuable information. A line to the committee at its headquarters, California Building, Union Square, San Francisco, is all that is necessary to receive it by return mail.



The New York Home of the Gyroscope.

**Gyroscope to Race.**—The first entries for the light car race at Savannah were made last week by the Gyroscopic Automobile Company, through A. L. Kull, the general manager. This will be the first appearance of the Gyroscopic cars in the racing field, but it is claimed that they have a valuable feature for this work in the gyroscopic action of the flywheel, which enables them to round corners at high speed. The photograph shows the Gyroscopic's New York home, 231 West Fifty-fourth Street.

**An International Auto Paper.**—Such is *La Voiturette*, published in Paris by Georges Dupuy. As its name implies, it is specially devoted to the interests of owners of runabouts and light touring cars, and its articles, whether technical, descriptive or humorous, are written by the best authorities and are very interesting. It contains a section in English, which is highly appreciated by English and American tourists in France. The offices of *La Voiturette* are located at 78 Rue Charles Lafitte, Neuilly-Paris.

**The Suggestion System.**—In order to make it easy for the employees to give the company the benefit of their ideas, the Chalmers-Detroit Company has inaugurated a suggestion bureau in its factory. A number of small registers, such as are used in many stores for making duplicate copies of bills, have been placed in convenient positions, and the employees are invited to write on these any suggestions they may wish to make regarding the work they are doing. Prizes are awarded quarterly for the best suggestions.

**Gramm-Logan Makes Announcement.**—The Gramm-Logan Motor Car Company, the formation of which was announced last week, announces that it is located at Bowling Green, Ohio, a few miles south of Toledo, affording excellent shipping facilities. J. B. Wilson, a man of great business experience, is president of the company; B. A. Gramm, formerly of the Logan Motor Car Company, is vice-president and general manager, and Fred Bisantz, superintendent.

**Dog-Hunting by Auto.**—Henry Mower, the stray dog commissioner of Worcester, Mass., was badly rushed with his work last week. The accumulation of jobs in various parts of the city looked hopeless until he had the bright idea of obtaining an auto.

The way he is now chasing around the city and mowing down the long list of delinquent dog-tax payers is creating a commotion in the city treasurer's office.

**Campaigning in Auto.**—Governor Fred M. Warner, of Michigan, who is making a vigorous campaign for reelection, uses a Jackson automobile to carry him to the towns where he is due to make speeches. During the past two months he has covered thousands of miles in this way and has made addresses in hundreds of towns and villages which he could not possibly have reached in the same length of time by any other means of conveyance. Mrs. Warner and Lieutenant-Governor Kelley frequently accompany him. The Governor has no fear of prejudicing the farmers by his use of the automobile, as many of the country people in the State own cars.

**Quick Mail Delivery.**—From Suffield, in the Connecticut tobacco belt, comes the news of a wide-awake rural mail carrier who has given up horses for the more speedy automobile. The carrier is himself a tobacco cultivator and he claims that the automobile saves him three hours, which he is enabled to devote to the cultivation of the "weed." He says it costs him just eighteen cents a day to operate the automobile, and horses cost him a dollar.

**Goodrich New York Headquarters.**—The B. F. Goodrich Company, Akron, O., will shortly erect a six-story building in New York City exclusively for its metropolitan headquarters. The site at 1776-1778 Broadway, now covered by the buildings occupied by the Stoddard-Dayton, Renault and Ajax-Grieb agencies, has been acquired, and the buildings themselves will be torn down to make way for a new structure erected especially for the purposes of the tire makers.

#### TRADE PUBLICATIONS

**Chalmers-Detroit Motor Company, Detroit, Mich.**—This company's 1909 catalog is a neat and business-like booklet, without any exaggerated "fine language," but crammed full of just the kind of information the average buyer wants. The first and larger part is devoted to the new Chalmers-Detroit 30, which has created such a sensation in the trade. A brief explanation of the company's policy for the coming year, and of their purpose in bringing out the car, is followed by a thorough and painstaking description, not too technical, and illustrated by a profusion of views of the motor, gears, and chassis from every possible position. The part of the catalog describing the Chalmers-Detroit 40 is not so detailed, as this car is practically unchanged from last year, and the company expects that the reputation the car has already acquired will be sufficient to sell the output.

**R. I. V. Company, New York.**—R. I. V. ball bearings form the subject of a handsome catalog issued by this company, which holds the American agency. These bearings are of the radial type, but are distinguished by the means used to separate the balls—a ring of anti-friction metal cast around them after they are arranged in their proper positions. The catalog contains a complete list of the different types and sizes of the bearings, and their dimensions, loads and prices, and also drawings showing various applications.

**Michigan Automobile Company, Ltd., Kalamazoo, Mich.**—A neat little booklet comes from this company describing their planetary transmissions for automobiles. These gears are made in two sizes, for either shaft or chain drive. The planetary pinions are arranged on the well-known

Ball system, with a triple-plate type of high speed clutch, cast iron against fiber. The smaller size is especially adapted to high wheel buggy autos.

#### IN AND ABOUT THE AGENCIES.

**Cadillac.**—Brown & Underwood, New Haven, Conn., agents for the Cadillac, will move into their new quarters at Broadway and Dixwell avenue about October 1.

**Chalmers-Detroit.**—D. B. Dey and O. T. Fenton have formed a partnership and will represent the Chalmers-Detroit line in Hightstown, N. J.

**Continental.**—The Continental Caoutchouc Company is about to open an agency in Los Angeles, Cal., which will be placed in charge of E. L. De Camp.

**Havoline Oil.**—T. E. Tomlinson, the secretary and general manager of the Havoline Oil Company, reports that he has made arrangements with W. P. Fuller & Co., of San Francisco, to take the agency of Havoline oil on the Pacific Coast, and in the Hawaiian Islands.

**Studebaker.**—The Studebaker Brothers Company has just acquired a piece of property at the corner of Alden and Chapman streets, Portland, Ore., and will immediately begin the erection of a brick garage.

**White.**—An agency of the White Company has just been established in San Diego, Cal. It is under the management of Earl Pfeifer.

#### PERSONAL TRADE MENTION.

**F. D. Stidham**, for a number of years with the Cadillac Motor Car Company, Detroit, Mich., and recently the chief observer in the A. A. A. tour, has just been appointed manager of sales for the automobile and motor boat departments by Stanley & Patterson, 23 Murray street, New York City. Mr. Stidham will devote a large part of his time to the sale of the Patterson "Wireless" dry battery holder.

**C. H. Smith—C. S. Calvert.**—The Winton Motor Carriage Company has engaged G. H. Smith and C. S. Calvert to cover Eastern and Western territory, respectively. Mr. Smith was formerly Philadelphia manager for the White, and Mr. Calvert for years sold Wintons in Newark, N. J.

**C. C. Crispen**, who has been connected with the Pennsylvania Automobile Company for the past five years, has recently severed his connection with that concern. An announcement of his future plans will be made shortly.

**George Arbuckle** has been appointed chief of the Winton supervisors by Sales Manager Churchill. Mr. Arbuckle has been on the Winton staff since 1902, company handles the Stoddard-Dayton.

**George R. Moran**, well known in the automobile industry, has accepted the position of sales manager of the Alamo Automobile Company, San Antonio, Tex. This company handles the Stoddard-Dayton for that territory.

**H. Oscar Brown**, formerly the Philadelphia agent of the American Locomotive Company, Providence, R. I., has joined the sales forces of the Bergdoll Motor Car Company in the Quaker City.

**William Cadzow**, formerly with the Wyckoff, Church and Partridge Company, has joined the Yonkers Auto Station, Yonkers, N. Y., Westchester county agents for the Stearns and the C. G. V.

**W. J. Coghlan—C. A. Duerr.**—Mr. Coghlan and Mr. Duerr are again associated as New York agents for the Moon. They formerly handled the Royal Tourist.



## INFORMATION FOR BUYERS

**Prest-O-Carbon Remover.**—This is one of the latest specialties being introduced by the Prest-O-Lite Company, Indianapolis, Ind. The purpose of the preparation is to effect a thorough removal of all carbon from cylinder heads, pistons, valves and other parts without the usual labor of taking the engine down and scraping. The

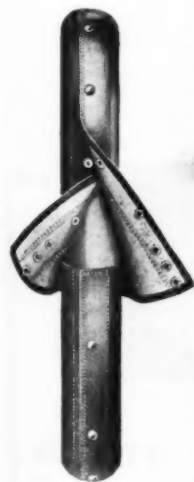


TWO NEW "PRESTO" SPECIALTIES.

compression space of the cylinder is filled with the Carbon Remover, which is allowed to stand for 30 minutes, and is then removed. After this the motor is run with the spark retarded and the throttle wide open, and the carbon, which has been dissolved and loosened, is blown out the exhaust. The makers guarantee that a single treatment is sufficient to remove every particle of carbon. It does not contain kerosene, but is a new combination of chemicals, and may be used several times before losing its strength. It is applied with an oil gun and removed in the same manner. It is put up in gallon, half-gallon and quart cans. Another specialty just placed on the market by this company is the Prest-O-Lite instantaneous detachable tank band, which fastens with a hinged thumbscrew, so that the tank may be put on and taken off in a fraction of the time formerly required. The new band is sold at the same price as the old style, and may be had from any dealer handling the Prest-O-Lite line.

### Gordon New England Tire Cover.

This is one of the many specialties manufactured by the Vehicle Apron & Hood Company, of Columbus, O. As shown by the accompanying illustration, it has been



GORDON TIRE COVER.

designed with a view to making the process of placing a tire in the cover or removing a tire from its cover a much shorter and more convenient operation than is the case with other methods of fastening. Snap fasteners are employed and they are placed on the cover in a position where they will come on the tread of the tire, thus affording a firm ground on which to press down in closing them. The tire in its cover may thus be laid down on or against any polished surface without any danger of marring it. Other specialties made by the same firm are

don automobile cape aprons and plain flat covers, also Gordon tool and inner tube cases and "fits all" lamp covers. All of these specialties are made of various grades of fabric and in a number of sizes to fit standard requirements.

**The Vacuum Muffler.**—Although not differing outwardly from the usual type of muffler, the "Vacuum" made by J. A. and C. A. Xardell, of Utica, N. Y., is constructed on an entirely different principle. The interior is divided into two chambers; in the first the force of the exhaust is utilized in such a way as to create a partial vacuum, and in the second the noise of the explosions is muffled. The vacuum chamber acts to increase the freedom of the exhaust and clear the cylinder more completely of burnt gases. The mufflers are made in two sizes, for engines of above and below 15 horsepower.

**Kempshall Non-Skid Tires.**—This is a patented tire of English manufacture, for which Cryder & Company, Park avenue and Sixty-third street, are the American agents. As will be apparent from the accompanying illustration, its chief feature lies in the peculiarly formed tread which differs radically from anything of the kind previously brought out, and which is said to make this tire superior to the usual steel-studded type as a preventive of side-slip and skidding. The tire itself consists of seven layers of special fabric interposed between layers of



THE KEMPSTALL NON-SKID TREAD.

rubber, the manner in which the pile is firmly united into one integral whole being the subject of another of Mr. Kempshall's numerous patents. Owing to the increased amount of radiating surface, the Kempshall tire is said not to heat to the same extent as the ordinary type.

**Front Springs for Fords.**—As a means of improving the forward suspension of the Ford runabouts, the Special Motor Vehicle Company, 223 East Fourth street, Cincinnati, O., has just brought out what they term "Shumard's front springs for Ford runabouts." These are of the usual full elliptic pattern and are supplied complete with all the necessary fittings for placing on the car, while the makers also supply detailed instructions so that the majority of autoists who are able to handle simple tools will find the operation one that easily lies with the scope of their mechanical powers.

**"Michigan" Planetary Gears.**—These are the product of the Michigan Automobile Company, Ltd., Kalamazoo, Mich., and are designed for either chain or shaft drive. Type K is made for cars of 12 to 20 horsepower, while Type L is for lighter work, ranging from 6 to 12 horsepower, and is especially adapted to the use of the buggy type of car. Either is supplied with the sprocket next to the flange of the main

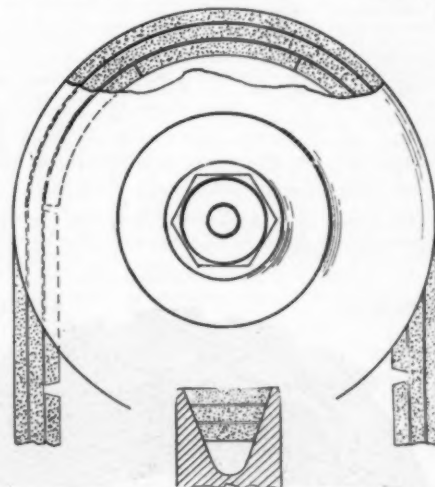
shaft and the clutch cone on the opposite end, or vice versa. The gears can also be made to fit a desired location by providing different lengths of shaft, different sizes of flanges and also different sprockets. The Michigan company is licensed to manufacture planetary gears of this type under the Ball patents, and their specialty is turning out large quantities to manufacturers' specifications, their plant being particularly adapted to this purpose. They are also



POPULAR-PRICED PREST-O-LITE TANK.

large makers of special designs of transmissions, jackshafts, rear axles with chain or bevel gear drive, and a combination of these various parts, as well as sliding gear sets of the selective type. The company is also in a position to turn out gasoline motors of from one to six cylinders. Some of the details of the Type K planetary gear will be of interest. The main shaft is drop-forged from 35 to 40-point carbon open hearth steel of best quality, and is made integral with its flange. It is hardened, as is also the cone, made from machine steel, while the gears are turned out in the same manner, and are all bronze bushed; the clutch dogs are of hardened tool steel. The clutch plates are of steel, cast iron and red fiber; they are of good size and afford ample friction surface.

**Challenge "V" Type Belt.**—This is one of the products of S. F. Heath & Company, 288 Columbus avenue, Boston, Mass., and is specially offered for motorcycle and automobile use. They are made of specially selected hides, tanned by a secret process to produce the maximum tensile strength, and they are not only waterproof, but also resist the action of steam, oil, gases and alkalis to a remarkable extent. The permanent stretch of a Challenge belt in service is so little and their power of re-



HEATH'S CHALLENGE "V" TYPE BELT.

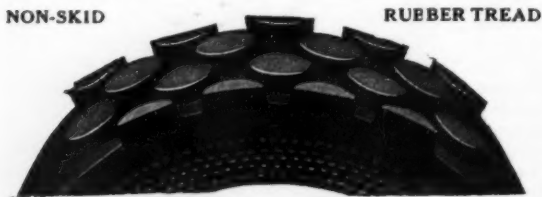
covering their normal tension when idle is so great that any slackness is usually taken up after a short rest, usually over night. As they are specially designed to prevent slipping, no idler is required. For the transmission of power on the motorcycle and for fan use on the auto the makers claim that they have no superior. The same company also supplies belts of the flat type, using the special Challenge leather.

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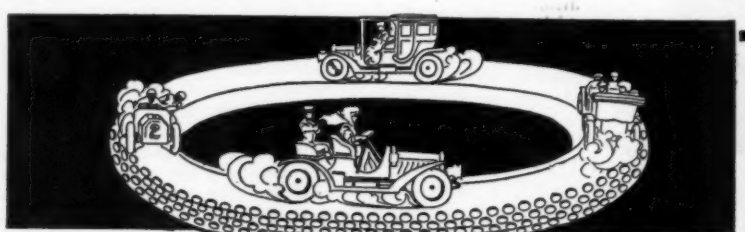
NON-SKID

RUBBER TREAD



# 90%

of the cars  
used Bailey  
"Won't-Slip"  
Tires in the  
Glidden Tour  
also by the  
Winner of the Glidden Cup  
for the past 3 years.



**SKIDDING** that one terrifying moment when if  
your car had been equipped with

## BAILEY'S "WON'T-SLIP" TIRES

the accident would not have occurred. Moral: "DO IT NOW" and you will avoid such accidents. You see them everywhere. Ask the rider; he knows. There is no metal in the Bailey Tread to heat the tire, pull loose from the rubber or tear the roadbed. Bailey Tires are not excluded from the Parks or Drives. The rubber studs of the Bailey Tread are the true principle that give perfect traction and prevent skidding. They are to the automobile what the rudder is to the ship. Write us for descriptive booklet.

N. B.—The extra cost of the Bailey Tires on the list more than smooth of same make is: 2 1-2 and 3 in., \$1.50 each; 3 1-2 in., \$2 each; 4 in., \$2.50 each; 4 1-2 in., \$3 each; 5 in., \$3.75 each.

C. J. BAILEY & CO., Patentees, 22 BOYLSTON STREET, BOSTON